AlphaStation™ 500 Series

User Information

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January 1997

This book introduces the AlphaStation 500 Series system. Use the information in this book to configure, start, use, update, and troubleshoot your system. You will also find general system information, such as console commands and system care, in this book.

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[S3420]

FCC CLASSIFICATION

There are many variants of AlphaStation 500 Series systems. Your AlphaStation 500 Series system may be classified as either a Class A or a Class B FCC/EMC device, depending upon its options and configuration.. To determine your system's classification, look at the FCC Classification Label on the bottom of the system.

FCC NOTICE -- CLASS A DEVICE

The equipment described in this manual generates, uses, and may emit radio frequency energy. The equipment has been type tested and found to comply with the limits for a Class A digital device pursuant to part 15 of FCC Rules, which are designed to provide reasonable protection against such radio frequency interference.

Operation of this equipment in a residential area may cause interference, in which case the user at their own expense will be required to take whatever measures are required to correct the interference. If shielded cables have been supplied or specified, they must be used on the system in order to maintain international regulatory compliance.

FCC NOTICE -- CLASS B DEVICE

This device complies with Part 15 of the FCC rules. Operation is subject to the following conditions:

(1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. Any changes or modifications to this equipment may void the user's authority to operate this equipment.

FCC NOTICE -- CLASS B DEVICE (continued)

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver is connected.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

The keyboard and video ports should be connected only with shielded data cables with an external ferrite bead over the cable. When either of these ports is connected with cables without such a ferrite bead, the additional ferrite beads shall be clamped over these cables next to the cable connector.

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Preface

Welcome to the Digital AlphaStation 500 Series System

This book introduces the Digital AlphaStation 500 Series system.

Use the information in this book to configure, start, use, update, and troubleshoot your Digital AlphaStation 500 Series system. You can also find general system information such as console commands and system care in this book.

Audience

If you will be operating, configuring, or adding options to the Digital AlphaStation 500 Series system, the information included in this book will be helpful to you.

Organization of the Information

This information for users covers the following topics:

- Chapter 1, *System Overview*, describes the hardware components, including the peripheral component interconnect (PCI) architecture, the controller, the keyboard, the system unit front panel, and the system unit rear panel.
- Chapter 2, *Getting Started*, describes installing, starting, restarting, and turning off the system.
- Chapter 3, *Installing System Options*, describes the system unit components and gives instructions and illustrations to help you remove and replace them.
- Chapter 4, *Troubleshooting*, describes system troubleshooting as well as the error beep codes.
- Appendix A, *Console Commands*, contains a basic description of the advanced RISC computing (ARC) console commands and the system reference manual (SRM) console commands.

- Appendix B, *System Care*, describes how to clean your system, monitor, mouse, and keyboard. It also contains instructions for moving and reinstalling your system.
- Appendix C, *Technical Specifications*, describes the technical characteristics of the system.
- Appendix D, *Device Mapping*, lists system device address mapping information, including I/O addresses and interrupts.
- Appendix E, *Updating System Firmware*, explains how to use the firmware update utility.
- Appendix F, *Starting an Operating System Installation*, provides the information you need to begin an operating system installation.
- Appendix G, *Sound Card Overview*, describes the Digital AlphaStation 500 Series system sound card.
- Appendix H, *Equipment Log*, contains tables that you can use to record information about your system hardware and software components.

Refer to the Table of Contents for a detailed listing of topics.

Conventions

This guide uses the following conventions:

Convention Example	Description
`c:\windowsc:\windows>`	Monospaced, bold text indicates file names, path names, directories, or screen text.
[Enter]	Square brackets surrounding text represent a key on the keyboard.
[Ctrl]+[R]	A plus sign between keyboard keys indicates that the keys shown should be pressed at the same time.
auto_action	Italic text indicates environment variables. Titles of information sources are in italic, and occasionally italic is used for emphasis in the text.
☞	A pointing hand indicates a reference to additional information.

Abbreviations

This guide uses the following abbreviations:

Abbreviation	Meaning
AC	alternating current
amp	ampere
ARC	advanced RISC computing (Windows NT console)
ARCINST	ARC installation program
C	Celsius
CD	compact disc
CD-ROM	compact disc read-only memory
CEE	International Commission for Conformity Certification of Electrical Equipment
CFG	configuration file
cm	centimeters
CPU	central processing unit
CSA	Canadian Standards Association
DC	direct current
DIMMs	dual in-line memory modules
DMA	direct memory access
DRAM	dynamic random-access memory
ECU	EISA configuration utility
EISA	extended industry-standard architecture
FDI	Floppy Drive Interconnect
flashROM	electrically erasable, rewriteable, nonvolatile memory
ft	feet
GB	gigabyte
Hz	hertz
IEC	International Electrotechnical Commission
I/O	input/output
IRQ	interrupt request
ISA	industry-standard architecture
ISACFG	ISA configuration file
ISO	International Organization for Standardization

Abbreviation	Meaning
Kb	kilobit
KB	kilobyte
kg	kilogram
lb	pound
LED	light-emitting diode
m	meter
MAU	media adapter unit
Mb	megabit
MB	megabyte
MHz	megahertz.
mm	millimeter
ns	nanoseconds
NVRAM	nonvolatile random-access memory
OSF	DEC Open Software Foundation/1 UNIX operating system
PCI	peripheral component interconnect
RISC	reduced instruction set computing
ROM	read-only memory
SCSI	small computer system interface
SIMMs	single in-line memory modules
SRM	system reference manual (the Digital UNIX and OpenVMS consoles)
SROM	serial read-only memory
UL	Underwriters Laboratories
VAR	value-added reseller
V AC	volts alternating current
VMS	Open VMS Operating System
W	watt

Special Notices

This guide uses three kinds of notices to emphasize specific information.

WARNING

A WARNING indicates the presence of a hazard that can cause personal injury.

CAUTION

A CAUTION indicates the presence of a hazard that can cause damage to hardware or that might corrupt software.

NOTE

A NOTE gives general information, such as compatibility with other products or pointers to other information.

Additional Information Resources

You may wish to consult the following information resource for additional information about your AlphaStation 500 Series system.

- *AlphaStation 500 Series Installation Information* (order number EK-ALPH5-IN), which presents a graphical overview of the AlphaStation *500* Series system installation.

Contact your distributor or Digital representative for other available product-related information or visit the Digital WorkStation web site.

- Digital WorkStation Web Page - http://www.workstation.com/text.html

Reader’s Comments

Digital welcomes your comments on this or any other manual. You can send your comments to Digital in the following ways:

- Internet electronic mail to: *readers_comments@zk3.dec.com*
- Mail:

 Digital Equipment Corporation

 Shared Engineering Services

 129 Parker Street - PKO3-2/21J

 Maynard, MA 01754-2199

 Please reference order number EK-ALPH5-UI. B01 in your correspondence.

1
System Overview

Introduction

Congratulations on your purchase of the AlphaStation 500 Series System. The AlphaStation 500 Engineering team is very proud of this product and you can be assured that this machine has been designed and tested with the utmost attention to performance and reliability. It can run OpenVMS, Digital UNIX, or Windows NT. Your machine's performance range can be extended by the addition of memory, PCI cards, video upgrades, and hard disk drives.

The AlphaStation 500 Series is a high-performance system that uses the latest microprocessor technology. The system can stand alone or function as a client in an office network environment. This chapter describes the AlphaStation 500 Series system hardware components, including the peripheral component interconnect (PCI) architecture, the keyboard, the system unit front panel, and the system unit rear panel.

Following the information provided here will assure safe and proper operation of your AlphaStation 500 Series System.

System Unit

Your AlphaStation 500 Series system uses a high-performance Alpha architecture CPU.

The system unit includes:

- Two accessible I/O bays: one for 3.5 inch x 1 inch floppy disk or 3.5 inch tape devices and one for 5.25 inch x 1.6 inch CD-ROM
- Two non-accessible I/O bays: one that can accommodate a single 3.5 inch x 1.6 inch device or two 3.5 x 1 inch devices. The bay below the floppy drive will accommodate a single 3.5 inch x 1.6 inch hard drive (not available with tape option).
- Diskette controller that supports one diskette drive
- Integrated PCI-based SCSI-2 controller with Direct Memory Access and external SCSI-2 connector that supports up to five SCSI devices. Initial offerings of the AlphaStation 500 support Fast/Wide 10Mb/sec SCSI which will be phased into Fast/Wide 20 Mb/sec SCSI.
- ThinWire or twisted-pair Ethernet ports.
- Four expansion slots - one for 64-bit PCI options; three slots for 32-bit PCI options.
- Eight industry standard DIMM connectors for a maximum of 1 GB.
- Keyboard and mouse
- Two serial ports and one bi-directional parallel port
- Built-in 16-bit audio card

☞ Refer to Appendix C, Technical Specifications, for additional information.

☞ See the Digital WorkStation Web Page for the latest details.
(http://www.workstation.com/text.html)

Enclosure Front Panel

Figure 1-1 shows a front view of the system enclosure with pointers to the controls and indicators (storage bay door removed for clarity). Table 1-1 describes these items.

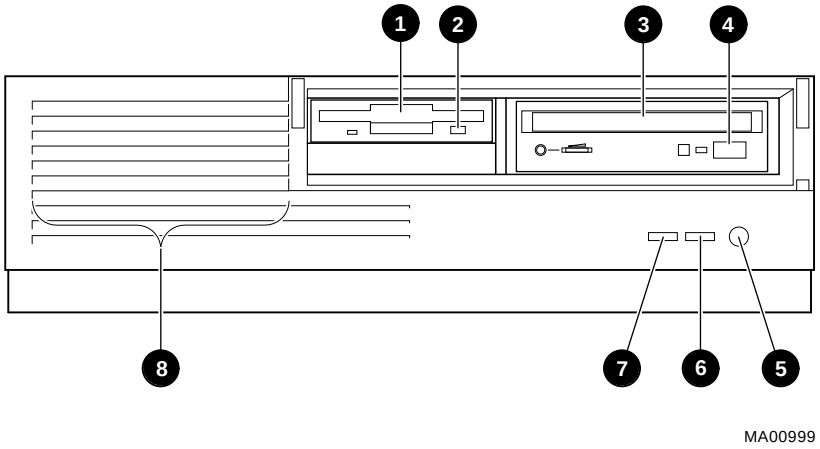


Figure 1-1 Front Controls, Indicators, and Drive Bay Locations

Table 1-1 Front Control, Indicators, and Drive Bay Locations

Figure Legend	Control or Indicator	Function
1	Floppy or tape drive bay	Location of external bay for 3.5-inch floppy diskette or optional tape device.
2	Diskette eject button	Releases a 3.5-inch diskette from the diskette drive.
3	CD drive bay	Location of 5.25-inch CD-ROM device.
4	CD-ROM eject button	Opens the CD loading drawer
5	Halt/Reset button	Jumper Selectable. When halt is pressed, the system halts immediately (the halt button is a momentary contact switch). When reset is pressed, resets the system and causes the self-test to run.
6	LED Indicator	DC On, lights when the system is on.
7	LED Indicator	Lights to indicate SCSI activity.
8	Louvered air intake	Passageway for cooling air to enter the system. *(Do not block the air intake.)*

Enclosure Rear Panel

Figure 1-2 shows the rear controls and connectors. Table 1-2 lists the rear controls and connectors and describes their functions.

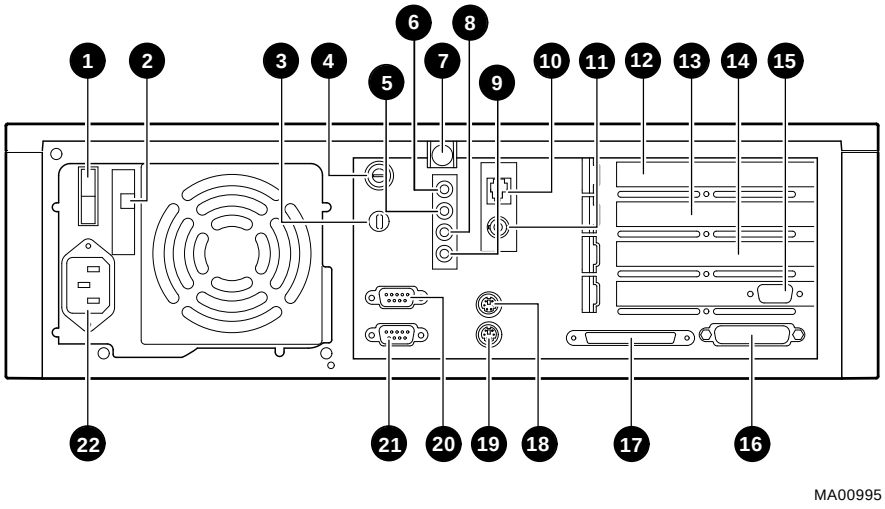


Figure 1-2 Rear Connectors (Rear View)

Table 1-2 Rear Connectors

Figure Legend	Item	Function
1	On/Off Switch	Power
2	Voltage selection switch	Allows user to set voltage from factory set 230V to 115 VAC power
3	Lock Slot	Use with optional Kensington type security lock
4	System (chassis) lock	Provides security for internal components.
5	Sound card stereo LINE OUT connector	Routes audio signals to an external amplifier
6	Sound card stereo headphone jack	Connects headphones, or amplified speakers
7	Top Cover Screw	Secures top cover
8	Sound card microphone jack	Connects microphone (2.2Ohm to 2.5V)
9	Sound card stereo LINE IN connector	Brings audio signals into the card (for example, from a stereo amplifier)
10	Twisted Pair connector	Connection to the embedded Ethernet controller
11	ThinWire connector	Connection to the embedded Ethernet controller
12	64-bit PCI expansion slot	Used for PCI expansion options
13, 14, 15	32-bit PCI expansion slots	In this example, a PCI graphics adapter is shown in the bottom slot. It provides the interface between the video/graphics expansion module (option) and the supported monitor.
16	Enhanced bi-directional parallel port	Connects an industry-standard parallel printer or other parallel device
17	Wide SCSI connector - 68-pin	Provides the interface between the system unit and external SCSI devices
18	Keyboard connector	Connects a VMS or PS/2 style keyboard
19	Mouse connector	Connects a PS/2-compatible mouse
20	COM1 - Serial port connector	Connects serial devices
21	COM2 - Serial port connector	Connects serial devices
22	AC power connector	Connects the system to AC power

The Keyboard

Your system comes equipped with a 101-key enhanced keyboard (shown in) that allows you to communicate with your system by entering data or commands. Note that some European keyboards have 108 keys. Refer to Figure 1-3 and Table 1-3 for information on keyboard key groups and functions.

☞ Refer to your operating system or application software documentation for software-specific key functions.

NOTE

You can adjust the angle of the keyboard for your comfort. The underside of the keyboard has feet that swing down and lock into place.

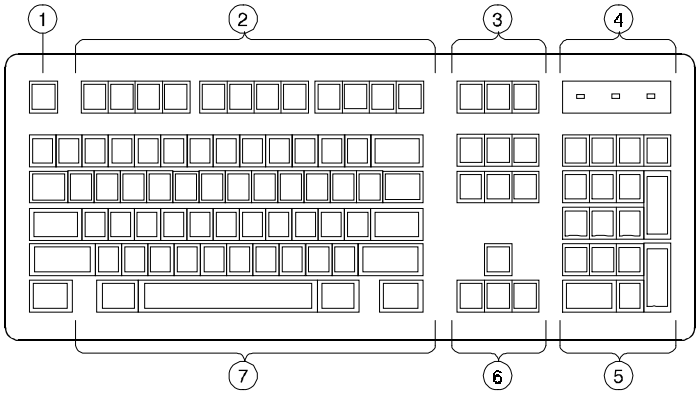


Figure 1-3 Typical Keyboard Layout

Table 1-3 Key Groups and Functions

Figure Legend	Key, Key Group	Function
1	[Escape] key	This key is program-specific. Its function is determined by the installed application software.
2	Function key group	These keys are program-specific. Their functions are determined by the installed application software.
3	Edit key group	These keys are program-specific. Their functions are determined by the installed application software.
4	Indicator lights	These lights indicate whether [NumLock], [CapsLock], or [ScrollLock] has been activated.
5	Numeric keypad	These keys perform numeric functions and software-defined functions, including cursor control. The [NumLock] key allows you to toggle between the numeric functions and software-defined functions.
6	Cursor control key group	These keys control the movement of the highlighted cursor on the monitor screen.
7	Alpha-numeric key group	These typewriter-specific keys feature automatic-repeat capability. If you press and hold down any of these keys, the keystroke repeats automatically until released.

2
Getting Started

Introduction

This chapter describes how to install, start, restart, and turn off your AlphaStation 500 Series system. You can also find information here about preloaded software as well as guidelines for system security. Figure 2-1 shows a typical AlphaStation 500 Series system.

WARNING

When unpacking and moving system components, be aware that some components (such as the system unit or monitor) may be too heavy for you to safely lift alone. If you are doubtful about whether you can lift these items alone, please get assistance.

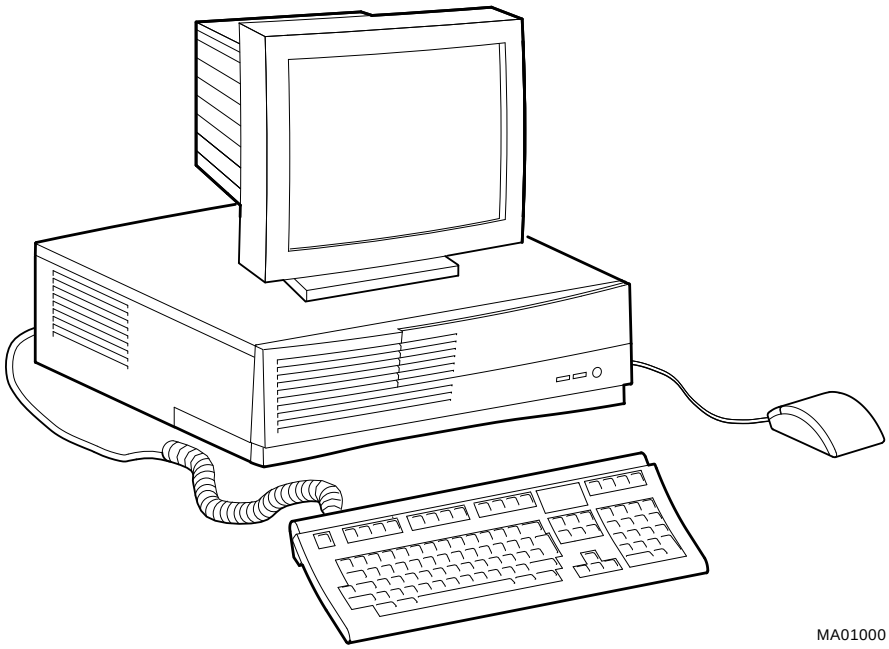


Figure 2-1 AlphaStation 500 Series System

Before Starting Your System

Before you start your system, follow this procedure:

1. Read and understand the information supplied with your system.
2. Select a well-ventilated site near a grounded power outlet and away from sources of excessive heat. Also, use an appropriate power strip to isolate the site from electric noise (for example, spikes, sags, and surges) produced by devices such as air conditioners, large fans, radios, and televisions.
3. Save all shipping containers and packing material for repackaging or moving the system later.

NOTES

- Do not install optional hardware or application software until you have started your system and verified that the base system is working correctly.
- On systems that have preloaded software, a label attached to the system unit informs you that there is licensed software installed. Carefully review the software license agreement shipped with your system.

Identifying the Correct AC Power Cord

The proper AC power cord accompanies your AlphaStation 500 Series system. Because variations exist from one country to another, and systems may be moved, inspect your power cord to ensure that it is the correct one for your country or region. If you are not sure that the supplied AC power cord is correct, contact your authorized Digital service representative or distributor before you use it.

WARNING

Do not attempt to modify or use an external 115V AC power cord for 230V AC input power. Modifying the power cord can cause personal injury and severe equipment damage.

Power cords supplied with the Digital AlphaStation 500 Series system meet the following criteria:

- The cords are UL-listed and CSA-certified, rated for use at 250V AC with a current rating that is at least 125% of the current rating of the Digital AlphaStation 500 Series system. In Europe, the cordage carries the <HAR> mark.
- The AC plug is terminated in a grounding-type male plug designed for use in the region. It must also have marks showing certification by an agency acceptable in the region.
- The connector at the computer end must be an IEC[1]-type CEE[2]-22 female connector.
- The cord length does not exceed 4.5 m (14.5 ft).

[1] International Electrotechnical Commission.

[2] International Commission for Conformity Certification of Electrical Equipment.

Installing Your System

The *AlphaStation 500 Series Installation Information* you received with your system graphically outlines the steps to follow to install your system.

1. Make sure you received all of your system components. Use Appendix H, Equipment Log, to list your equipment. If something is missing, please contact your distributor or Digital representative.
2. Position your system so that air can flow freely to and from the vents, as shown in Figure 2-2.

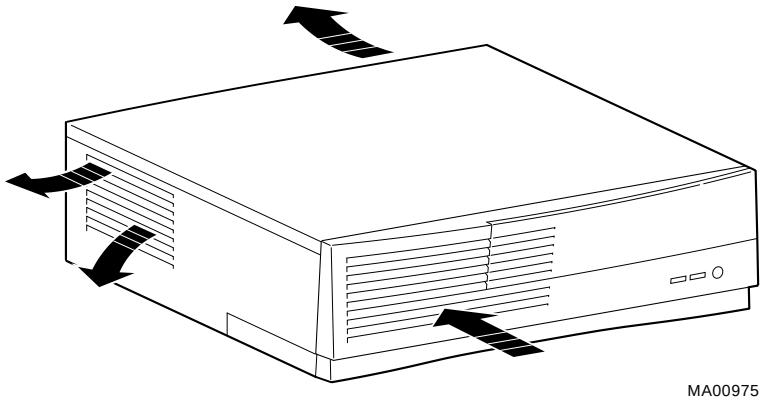


Figure 2-2 System Enclosure Airflow

CAUTIONS

To ensure that your system is properly cooled:

- Make sure that air can freely flow into the front, out of the side and rear of the system unit.
- Do not remove a filler plate until you are ready to add a new system component.

Connecting System Components

To connect the components of your AlphaStation 500 Series system, refer to Figure 2-4 and follow this procedure:

NOTE

The AlphaStation 500 Series system runs on 88V–264V AC and 47–63 Hz.

1. Confirm that the voltage selector switch matches your local voltage (either 115 Volts or 230 Volts), as Figure 2-3 shows.

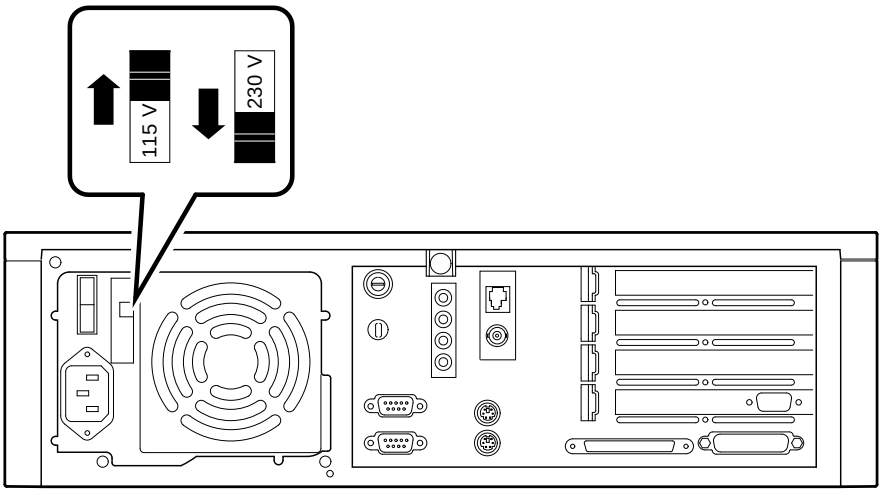


Figure 2-3 Voltage Select Switch

2. Ensure that the On/Off switch is in the Off (0) position. See Figure 2-5 for a view of the switch positions.
3. Connect the mouse, keyboard, video cable, and power cords to the system components, as shown in Figure 2-4. There is one 68-pin (wide) SCSI external expansion port in the lower-right rear panel.

NOTE

If you disconnect the mouse or keyboard during operation, data will be lost and you will have to power-cycle the entire system.

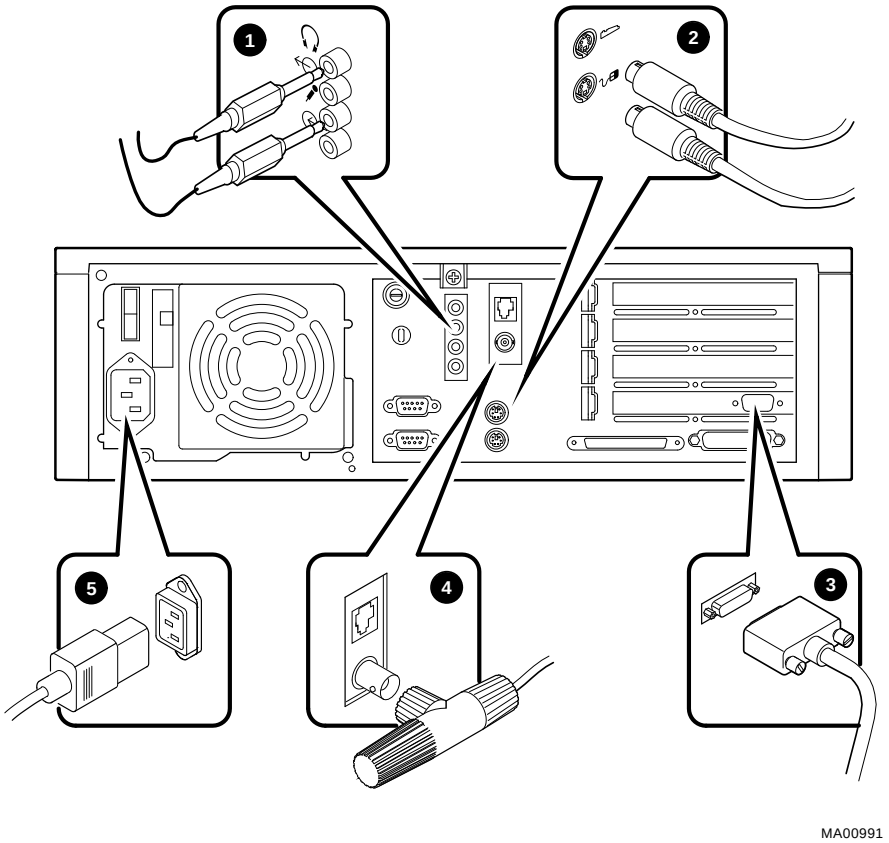


Figure 2-4 Connecting Cables and the Power Cord

❶ Audio connector (Headphone - top, Microphone - second from bottom)
❷ Keyboard/mouse connectors (Keyboard - top, Mouse - bottom)
❸ Monitor connector
❹ Network connectors (Twisted pair - top, ThinWire - bottom)
❺ Power connector

4. If you have an external small computer system interface (SCSI) interface or SCSI storage box, connect the SCSI cable to the SCSI port on the rear of the system. See the section on SCSI Termination in Chapter 3 for additional information.

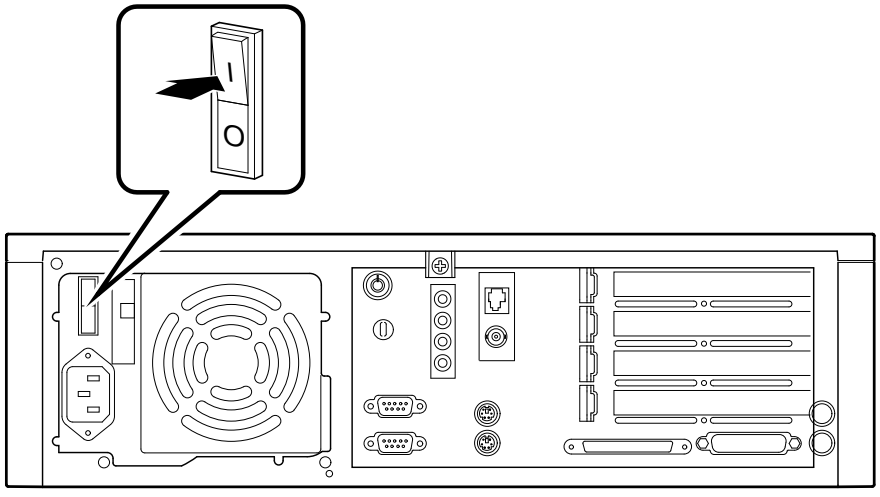
Network Connection

The AlphaStation 500 Series MAU module has ThinWire, and twisted-pair connectors for connecting to a network. Use the appropriate connector for your application.

Starting Your System

Perform the following steps to start your AlphaStation 500 Series system:

1. Turn on the system unit, monitor power, and any external devices. Figure 2-5 shows the location of the system unit On/Off button.
2. If necessary, adjust the monitor contrast and brightness to obtain a readable screen display. Refer to the information supplied with your monitor for further instructions.
3. Allow your system to complete any power-on self tests and device initialization messages. This will take approximately 1 minute. If you are using the Digital UNIX or OpenVMS operating systems, and the *auto_action* environment variable is set to **`Boot`**, the system starts as soon as the self tests have completed (less than 2 minutes). If you are using Windows NT, the operating system starts after a countdown expires (default is 10 seconds).



MA00996

Figure 2-5 Starting Your System

Preloaded Operating System Software

Your AlphaStation 500 Series system comes with one of the following operating systems preloaded:

- Digital UNIX
- OpenVMS

NOTE

Windows NT is available but is not preloaded on your AlphaStation 500 Series system.

Depending on how the environment variables are set, your system shows one of the operating system-specific displays described next, after the self tests complete successfully.

Digital UNIX

If you are using the Digital UNIX operating system, either you see a **>>>** prompt (if *auto_action* is set to Halt) or the system proceeds to boot Digital UNIX (if *auto_action* is set to **Boot**) when you power on your system.

☞ For more information, refer to your operating system documentation.

OpenVMS

If you are using the OpenVMS operating system, either you see a **>>>** prompt (if *auto_action* is set to Halt) *or* the system proceeds to boot OpenVMS (if *auto_action* is set to **Boot**) when you power on your system.

☞ For more information, refer to your operating system documentation.

Switching Console Firmware

To switch from the ARC console (used with the Microsoft Windows NT Workstation operating system) to the SRM console (used with the Digital UNIX and OpenVMS operating systems), follow these steps from the Boot menu:

1. Select **`Supplementary menu...`**
2. Select **`Set up the system...`**
3. Select **`Switch to OpenVMS or Digital UNIX console`**
4. Select **`Switch to OpenVMS`**
 -or-
 Select **`Switch to Digital UNIX`**
5. Select **`Setup menu...`**
6. Power-cycle the system (or press Reset button) to implement the change.

To switch from the SRM console to the ARC console,

at the SRM prompt (**`>>>`**), type: **`Set OS_TYPE NT`**

and power-cycle system.

If No Operating System Is Installed

☞ If an operating system was not preloaded on your system, refer to your operating system documentation for information on how to load it.

Turning Off Your System

Before turning off your system, make sure to save and close all open files. If you turn the system off without saving and closing files, you could corrupt some or all of your data.

To turn off your system, follow this procedure:

1. Close any application data files you have open as well as any applications you have running. Most application programs prompt you to save the information before closing.
2. Shut down the operating system with the appropriate command from Table 2-1 on the following page.

Table 2-1 System Shutdown Commands

Operating System	Action
Windows NT	From the Program Manager File menu, choose **Shutdown**. Choose the OK button to confirm.
Digital UNIX	Type the following from a superuser account: **shutdown -h now**
OpenVMS	Type the following from a privileged account: **@sys$system:shutdown**

3. Wait for the operating system to complete the shutdown process. For Digital UNIX or OpenVMS, the SRM console prompt (**>>>**) is displayed. Windows NT displays a window indicating it is safe to turn off or restart the system.
4. Do not turn off power to your system and peripherals until the shutdown sequence completes.

Computer Security

Use the security lock and passwords to protect your Digital AlphaStation 500 Series system.

Security Lock

To avoid theft of internal components, your Digital AlphaStation 500 Series system comes with a security key lock, which is located on the back of your system unit. When this lock is in the locked position, no one else can open the system box. Store the key in a safe place.

Passwords

You can set your system for screen saver and pause screen passwords. See your operating system documentation for more information on the availability and use of these options.

Posture and Work Habits

If you use poor posture while you work or if your equipment is poorly positioned, personal injury may result (as suggested by certain recent scientific articles). Although other articles

suggest that there is no cause and effect, we strongly recommend that you read and follow the precautions outlined in Table 2-2. In addition, be sure to adjust your work area so that you are comfortable.

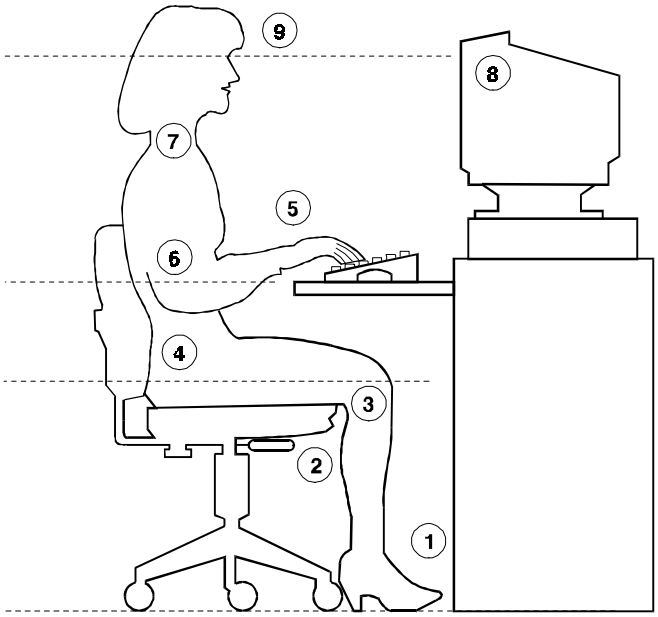


Figure 2-6 Recommendations and Posture and Work Habits

Table 2-2 Recommendations for Posture and Work Habits

Adjust	Figure Callout	To allow the following conditions:
Chair	1	Your feet are flat on the floor.
	2	Your legs are vertical and form a right angle to the floor.
	3	Your thighs are horizontal, and they are not bearing weight. To prevent restriction of the blood flow, keep the backs of your knees away from the seat so you do not compress the area behind them.
	4	Your upper body is erect and your lower back is supported with a backrest.

Adjust	Figure Callout	To allow the following conditions:
Keyboard and Mouse	5	Your wrists are straight and do not flex more than 15 degrees. They are supported and do not rest on sharp edges. If you use a mouse, rest your hand on the mouse so your wrist is not on the work surface. Operate the mouse close to your body's centerline.
	6	Your upper arms are straight down at your sides, and your elbows are close to your sides and support your arm weight. Forearms are at a 70- to 90-degree angle.
Head	7	Avoid neck strain. Your head should incline downward, but no more than 15 to 20 degrees.
Monitor	8	The monitor should be no higher than the level of your eyes and at the correct distance for your vision.
	9	Avoid eye fatigue, which can be caused by glare, image quality, uncomfortable furniture, eye height, and uncorrected vision. If you cannot focus to read at different distances, you may need special glasses. Relax your eyes periodically by focusing on distant objects.
Lighting		Direct lighting or sunlight on the screen causes glare and reflections. Place lighting behind or to the side of your work area, and distribute the lighting evenly on your work area.
Noise		Keep background noise at a minimum. Background noise above 65 dBa is tiring. Sound-absorbing materials (for example, curtains, carpeting, and acoustic tile) can help reduce background noise.
Temperature		The temperature should be between 20° and 23°C (68° and 74° F).
Humidity		The humidity should be between 30% and 70%.
Ventilation		Provide adequate air ventilation to operate the equipment and avoid fatigue.
Work Area		Your work area should be greater than 70 cm (28 inches) center to center, preferably 152 cm (60 inches).

WARNING

If you experience pain or discomfort while using your system, rest and review the instructions for posture and work habits. If the pain or discomfort continues after resuming work, discontinue use and report the condition to your job supervisor or physician.

3
Installing System Options

Introduction

This chapter covers the following topics related to installing system options on the Digital AlphaStation 500 Series system:

- Opening and closing the system cover
- Installing additional system memory
- Installing expansion boards/PCI bus options
- Installing internal drives
- Connecting external devices
- Cable layout for power, SCSI, FDI and audio cables

CAUTION

When working on the internals of the system unit (for example, replacing an option), you must wear a grounded wrist strap.

Top Cover/Left Side Panel

To gain access to the inside of the AlphaStation 500 Series system unit, remove the top cover, and the left side panel.

Removing the Top Cover and Left Side Panel

To remove the top cover and left side panel, follow this procedure:

1. Turn off your system and all external peripheral devices.
2. Unplug the power cord from the wall outlet.
3. Wait at least 15 seconds, to allow time for the power supply capacitors to discharge safely.
4. Unlock the top cover by turning the key counter clockwise, as shown in Figure 3-2.

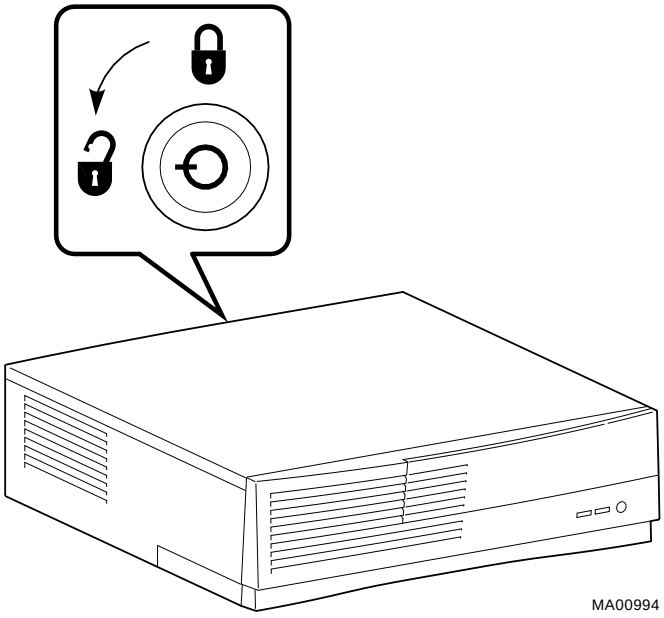


Figure 3-1 Unlocking the Top Cover

CAUTION

To avoid system damage from static discharge, wear a grounded wrist strap before you touch anything inside the system.

5. Facing the rear of the unit, locate and loosen the thumb screw that fastens the top cover to the rear panel. Place your thumbs on the upper corners of the rear panel, pull back on the cover sides, and lift the cover up and away from the enclosure.
6. If necessary to access the item you are servicing, the left side panel, nearest to PCI options, is removed by sliding the panel toward the rear of the system unit (as shown in Figure 3-2) and removing it.

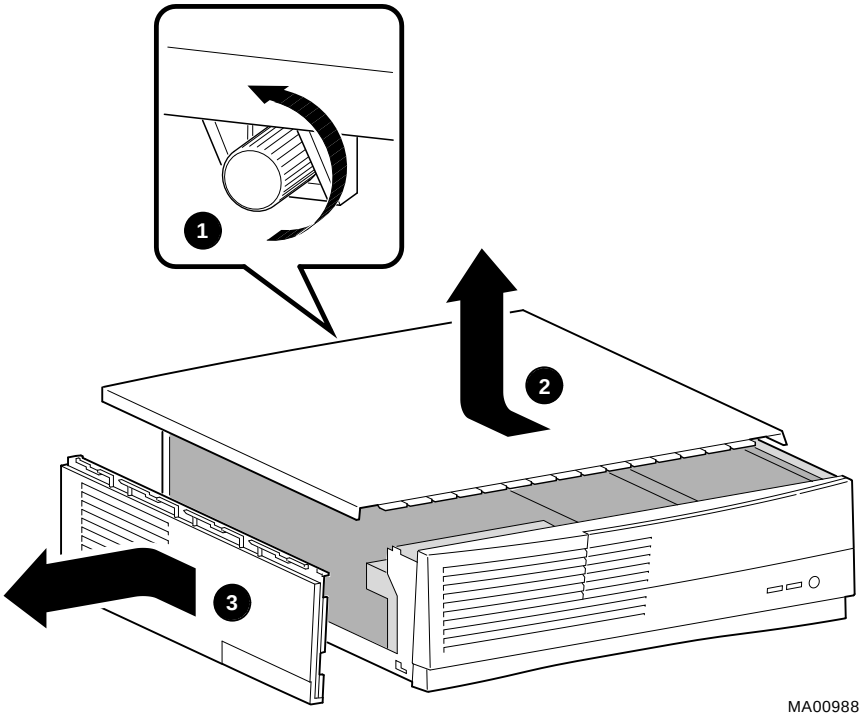


Figure 3-2 Removing the Top Cover and Left Side Panel

System Unit Components

Figure 3-3 shows the location of the AlphaStation 500 Series system unit components. Table 3-1 lists the system unit components.

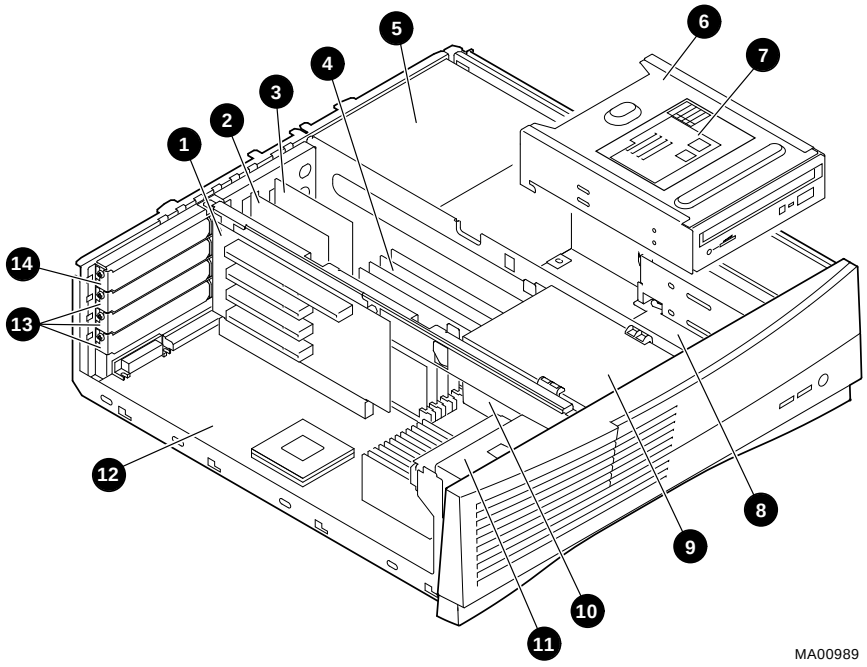


Figure 3-3 System Unit Components

Table 3-1 System Unit Components

Figure Legend	Component
1	Riser Card for PCI (peripheral component interconnect option cards)
2	Media adapter unit (MAU). Provides twisted pair and ThinWire Ethernet connections.
3	Audio Card
4	Memory modules (two banks with four DIMMs in each bank)
5	Power supply and fan
6	Right upper external drive bay for 5.25-inch x 1.6 inch device (CD-ROM)
7	Customer Configuration Label
8	Right lower internal drive bay for: **one** 3.5-inch x 1.6 inch device (optional) ***or*** **one** 3.5-inch x 1 inch device (optional) ***or*** **two** 3.5-inch x 1 inch devices (optional)
9	Left upper external drive bay for 3.5-inch x 1 inch device (Floppy) or tape drive
10	Left lower internal drive bay for 3.5-inch x 1 inch device, not available with tape option
11	System cooling fan
12	System board
13	PCI expansion slots, (three 32-bit slots)
14	PCI expansion slot, (one 64-bit slot)

System Board

Figure 3-4 shows the location of the AlphaStation 500 Series system board components. Table 3-2 describes these components.

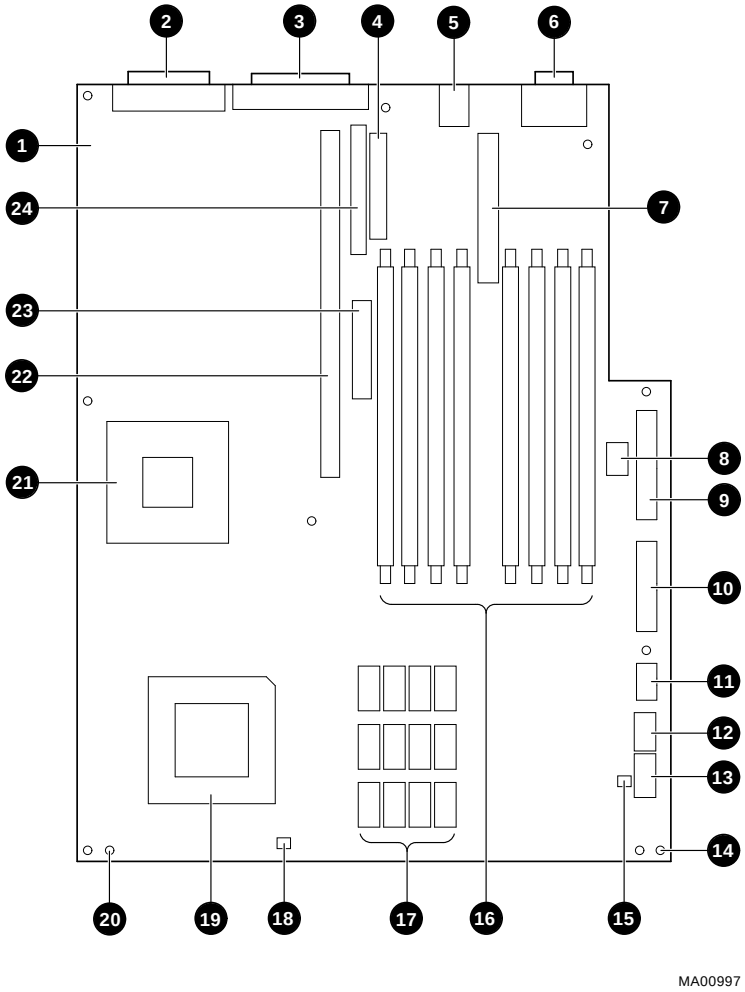


Figure 3-4 System Board Components

Table 3-2 System Board Components

Figure Legend	Components
1	System board
2	Parallel Port (J41)
3	External SCSI (J42)
4	3.5 inch removable media interface connector (Floppy) (J38)
5	Keyboard (top) /Mouse (bottom) connectors (J39)
6	Serial ports (Comm 1, top/ Comm 2, bottom) (J40)
7	Audio card (J36)
8	SROM port (J24)
9	Power connector (+5V sense, -5V sense) (J21)
10	Power connector (+3.43 sense) (J8)
11	Power connector (+12V) (J7)
12	LED's Halt/Reset cable connector (J5)
13	Diagnostic port (MFG only) (J4)
14	Locating pin holes (2 places)
15	Cache fan connector (J3)
16	Connectors for DIMM memory modules (J23, J24, J25, J26, J27, J28, J29, J30)
17	Cache
18	System fan connector (J1)
19	Alpha CPU
20	Mounting holes (9 places)
21	CIA Bridge
22	Riser card (J34)
23	Media Adapter Unit (MAU) Connector Header (J32)
24	Internal SCSI Header (J37)

System Memory

The AlphaStation 500 Series memory sub-system has two banks of memory, which include (4 x 72) 8 byte Dual In-Line Memory Modules (DIMMs). The are two banks consisting of four DIMMs. Adding more memory allows your system to run larger, more memory-intensive software. You can increase your system's RAM to 1 GB.

Cache Memory

Each AlphaStation 500 Series system has either 2 MB or 8 MB on the system board. Cache size depends on the Model ordered.

Memory Configuration Rules

- Random-access memory can be added only in four DIMM increments (four per bank).
- There are two banks, A & B. Bank A includes J30, J28, J26 and J25. Bank B includes J23, J29, J27, and J22. Refer to Figure 3-5 and Figure 3-6.
- Always fill at least one bank completely (A or B)
- To fill a bank, start at one end and fill every other DIMM socket. Each bank MUST be completely filled with like DIMMs.
- Do not mix DIMMs within a bank
- Use same DIMM size within a bank.
- Use same DIMM vendor within a bank (recommended).

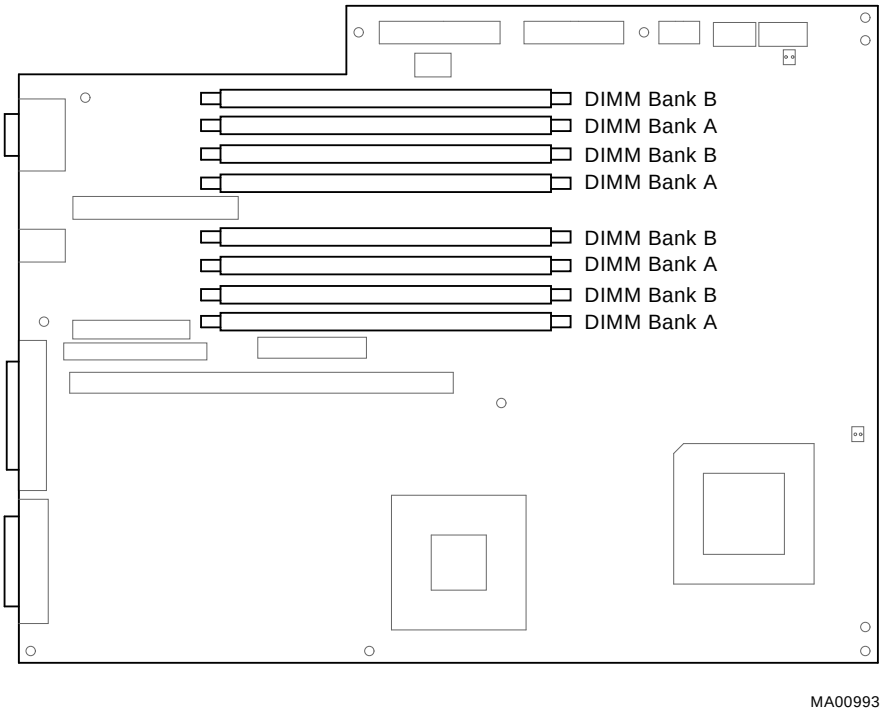


Figure 3-5 DIMM Bank Configuration

Adding or Removing Memory Modules (DIMMs)

To add or remove a set of memory modules (DIMMs) to a bank, see Figure 3-6 and follow this procedure:

1. Turn off your system and unplug the power cord from the wall outlet.
2. Unlock and remove the screw that secures the top cover and remove the cover, as described earlier in this chapter.
3. To remove a DIMM, push back the latches ❶ on the connector slot and lift the DIMM straight up ❷. Before installing a DIMM, inspect the connector ends of the DIMM ❸ and rotate DIMM to insure proper fit into DIMM connector slot. Install the DIMM into the socket by inserting connecting end of the DIMM, straight down into the socket until the two latches engage and lock. Refer to Figure 3-6. **Repeat this process for all four DIMMs.**

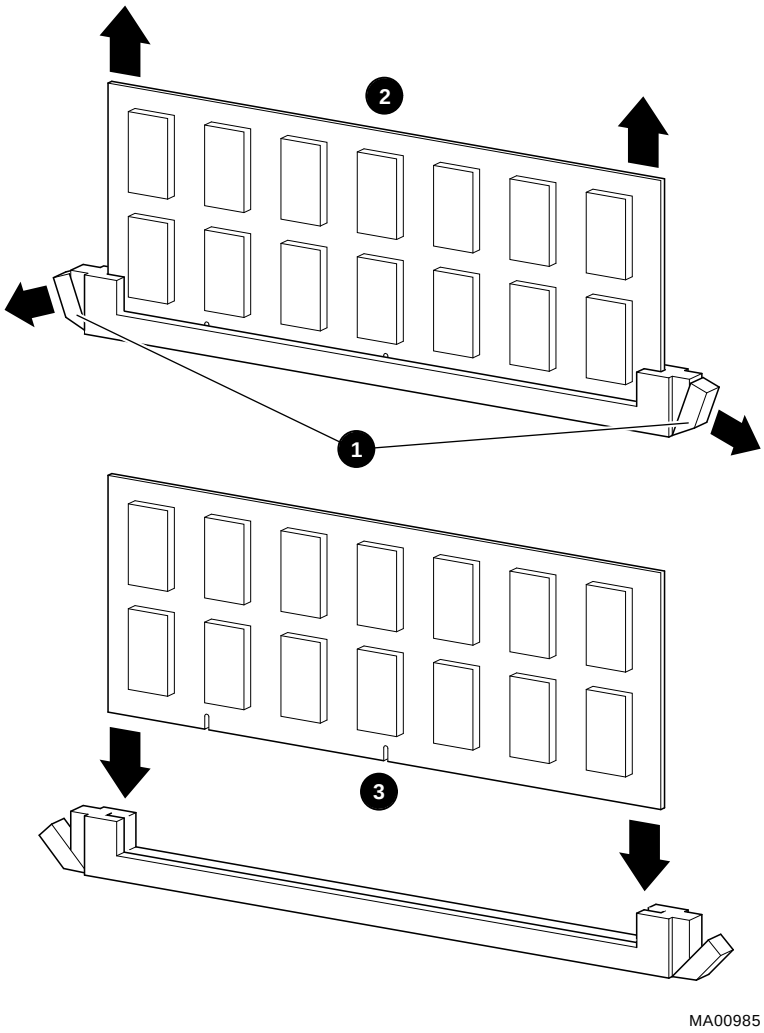


Figure 3-6 Installing a DIMM

4. Replace top cover, secure with screw and lock the key/lock, as described earlier in this chapter.
5. Connect the power cord and plug it into the wall outlet.

Storage Devices

The AlphaStation 500 Series system supports five storage devices. The AlphaStation 500 Series system comes equipped with two accessible devices, a slimline 3.5-inch diskette or optional tape drive, and a 5.25-inch half-high removable media device (CD-ROM). In addition, up to three non-accessible, optional hard drives may be installed within the internal storage bays. See Figure 3-3.

General Information on Installing Drives

This section covers general drive installation information, including internal and external SCSI drives, external SCSI, and cable layouts.

SCSI Addresses (SCSI ID's)

Before installing a SCSI drive, you must either set or verify the setting of the drive's SCSI address (SCSI ID). The SCSI controller chip is normally assigned device ID seven. Digital recommends that you use Table 3-3 as a guide for the selection of an address for your SCSI drive.

Table 3-3 SCSI Address Recommendations

SCSI Address (ID)	Device (Drive) Recommended
0	System disk (where your operating system resides)
1	Expansion/hard drive
2	Expansion/hard drive
3	Expansion
4	Tape drive
5	CD-ROM drive
6	Expansion
7	Host adapter (SCSI controller)

See Figure 1-2 for the location of the SCSI bus terminators. Refer to the section on SCSI Connectors in Appendix C, Technical Specifications, for additional information.

CAUTION

Failure to properly set up the SCSI termination may result in loss of data or damage to the file system.

SCSI Termination

The AlphaStation 500 Series system contains an embedded SCSI bus that is used to connect both the internal and external drives. Both ends (and only at the ends) of the SCSI but MUST be terminated correctly.

External SCSI Connector Termination

An external terminator is required when the SCSI port is not being used.

Internal SCSI Termination

The internal SCSI cable used for the AlphaStation 500 Series is a flat ribbon cable with integrated termination. Therefore, NO storage devices should have termination enabled.

SCSI Bus Length

The total SCSI bus length, including internal cables and etch on the motherboard as well as the external cables between storage between the storage enclosures and the must not exceed 3 meters (9.8 feet) for fast SCSI operation or 4 meters (13.1) feet for slow SCSI (5MB/second). The AlphaStation 500 Series system's internal SCSI length is 1.2 meters (3.9 feet), leaving 1.8 meters (5.9 feet) available for fast SCSI use (2.8 meters [9.2 feet] for external slow SCSI use).

Installing Optional Internal Storage Devices

This section tells you how to install optional hard drives into the two removable drive tray brackets that are located in the internal mass storage bays (right & left). The SCSI hard disk drives, CD-ROM, and floppy drives are all mounted on removable drive tray brackets.

To install an internal storage device, follow this procedure:

1. Turn off your system and unplug the power cord from the wall outlet.
2. Unlock and remove the top cover, as described earlier in this chapter.

Installing Hard Disk Drives in the Lower Right Side Inner Bay

The lower right side drive bay (below the CD-ROM), contains a drive tray that accommodates up to two hard drives: ***either*** one 3.5 inch x 1.0 inch hard disk, ***or*** one 3.5 inch x 1.6 inch hard disk, ***or*** two 3.5 inch x 1.0 inch hard disks. Due to thermal considerations, you ***cannot*** install a 3.5 inch x 1.6 inch hard disk ***and*** a 3.5 inch x 1.0 inch hard disk ***simultaneously*** in this bay. Follow these procedures:

1. Set the SCSI drive device jumpers or switches for the desired SCSI ID (address). This address depends on the unit numbers currently in use. (See Appendix D, Device Mapping, for a list of typical SCSI ID assignments. Appendix H, Equipment Log, contains space to record your systems SCSI ID assignments.) Follow the guidelines in the manual that came with the drive.

NOTES

- The CD-ROM is always installed in the top right side slot.
- The CD-ROM and optional tape drives are narrow SCSI devices. You must use a wide-to-narrow SCSI adapters with it. One adapter (part number 17-04009-01) is supplied with the system.
- If you are using Wide SCSI drives, you do not need the adapter.

Removing the CD-ROM

1. To access the lower right side drive bay, push in the button tab ❶ on the enclosure wall that releases the CD-ROM assembly. Slide CD-ROM back (towards the power supply) ❷. Lift the CD-ROM assembly up and out of the system unit as shown in Figure 3-7 and Figure 3-8. The CD-ROM is secured within the bracket by two screws. It is not necessary to remove the cables from the CD-ROM. Remove cables from the drive only *after* the assembly has been lifted out of the system unit, if you must remove them.

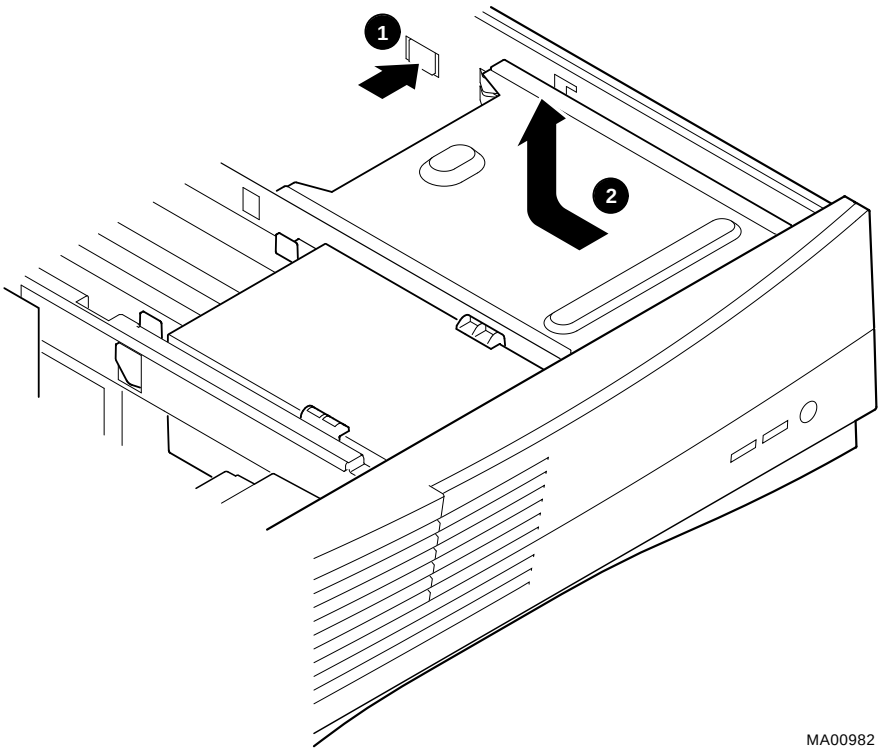


Figure 3-7 Removing the CD-ROM Bracket

Removing the Drive Tray from the Lower Right Side Inner Bay

1. Refer to your drive documentation to configure the drive. You must select a SCSI address and make sure SCSI termination is disabled. Terminator power should be enabled. Record the SCSI address you use in Appendix H.
2. To remove the lower right side drive tray, push in the button latch ❶ on the right side of enclosure that releases that drive tray. Slide it back ❷, lift it up and out of the enclosure, as shown in Figure 3-8.

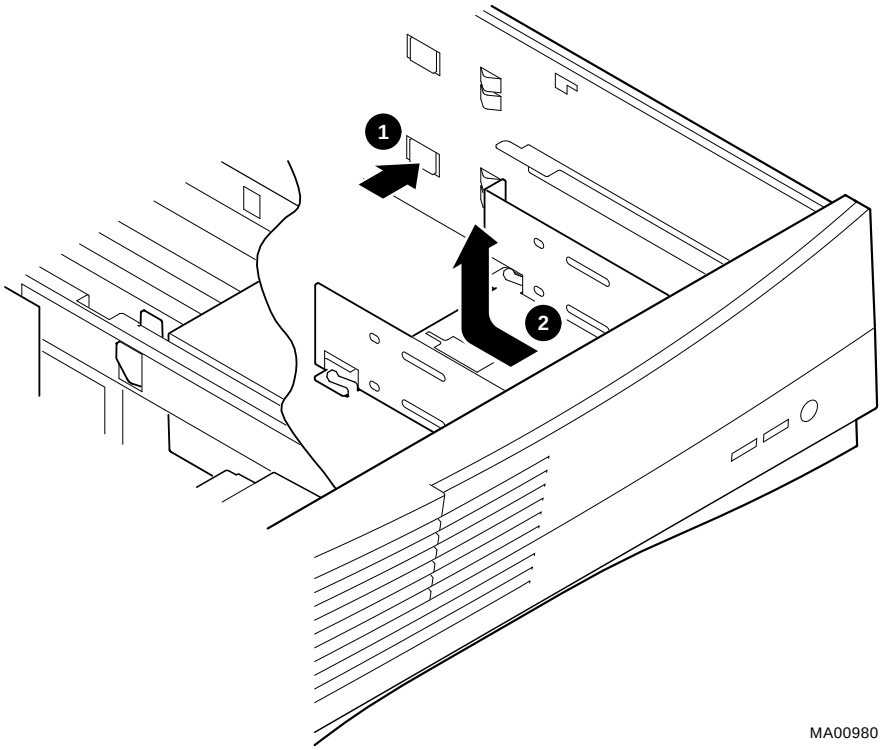


Figure 3-8 Removing the Hard Drive Tray Bracket

Installing Drives In the Right Side Bracket

NOTE

- The lower right side drive tray bracket will accommodate optional drives in the following combinations only: ***one*** 1.6 inch high storage device in the ***lower position only***, ***or*** up to two 1.0 inch high devices (one in upper position and one in lower position).

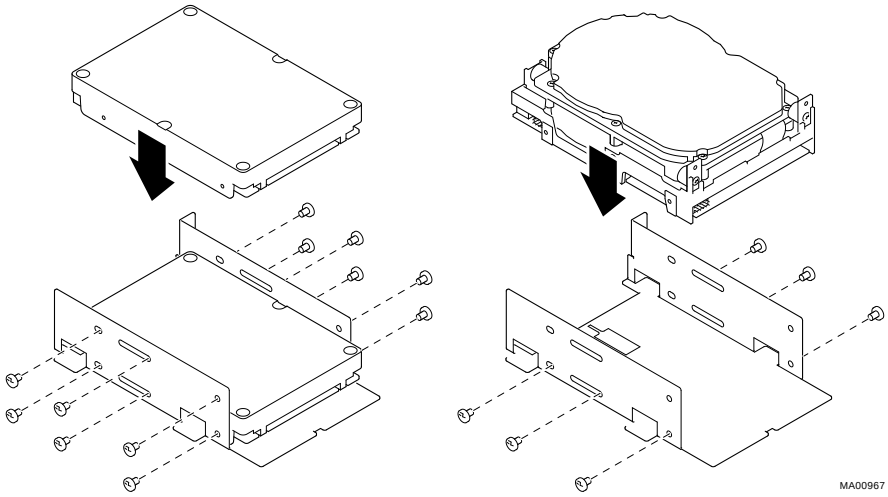


Figure 3-9 Installing Drives in the Right Side Bracket

1. Orient the bracket, as shown in Figure 3-9. Position the drives so that the cable connections face to the rear of the system. Select the bracket mounting holes that match the threaded holes in the drives. Mount the drives in the tray bracket, securing them with the four screws provided with each drive.
2. Connect the power and SCSI cables to the drives before fully inserting and securing the devices. Refer to Figure 3-10, which depicts the *rear* view of both storage bays.

 Figure 3-10 shows, in this example, the SCSI bus and power cabling configuration for two optional 3.5-inch x 1.0 inch SCSI hard drives, in the bay beneath the CD-ROM. Also shown, is the floppy drive bracket with the SCSI and power cabling for the one optional 3.5 inch x 1 inch SCSI hard drive (in the lower position, beneath the floppy drive).

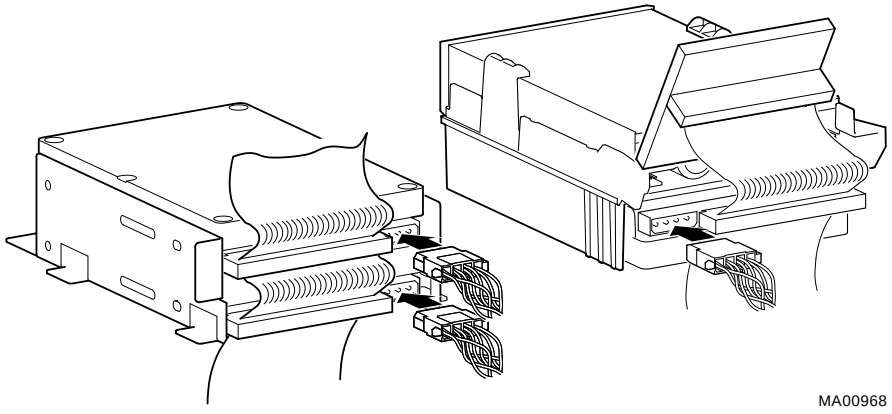


Figure 3-10 Cabling the Optional Hard Drives

3. Replace the drive tray into the lower right side storage bay. Slide the bracket forward until it locks in place. Refer to Figures 3-11 through 3-15 for cable additional cable configurations.

 Verify that the cables are connected in the correct orientation. All cables and *most* connectors are keyed so that you cannot connect them incorrectly. If your drive is not keyed, you must connect pin 1 of the cable to pin 1 of the connector.

 Pin 1 of the cable is on the edge with the colored stripe or pattern. Pin 1 of the connector should be marked with a small number "1" at one end of the connector or with a small number “1” or “2” printed on the circuit board near one end of the connector.
4. Replace the CD-ROM bracket assembly. Slide it forward until it locks in place.
5. Connect the power cord and plug it into the wall outlet.

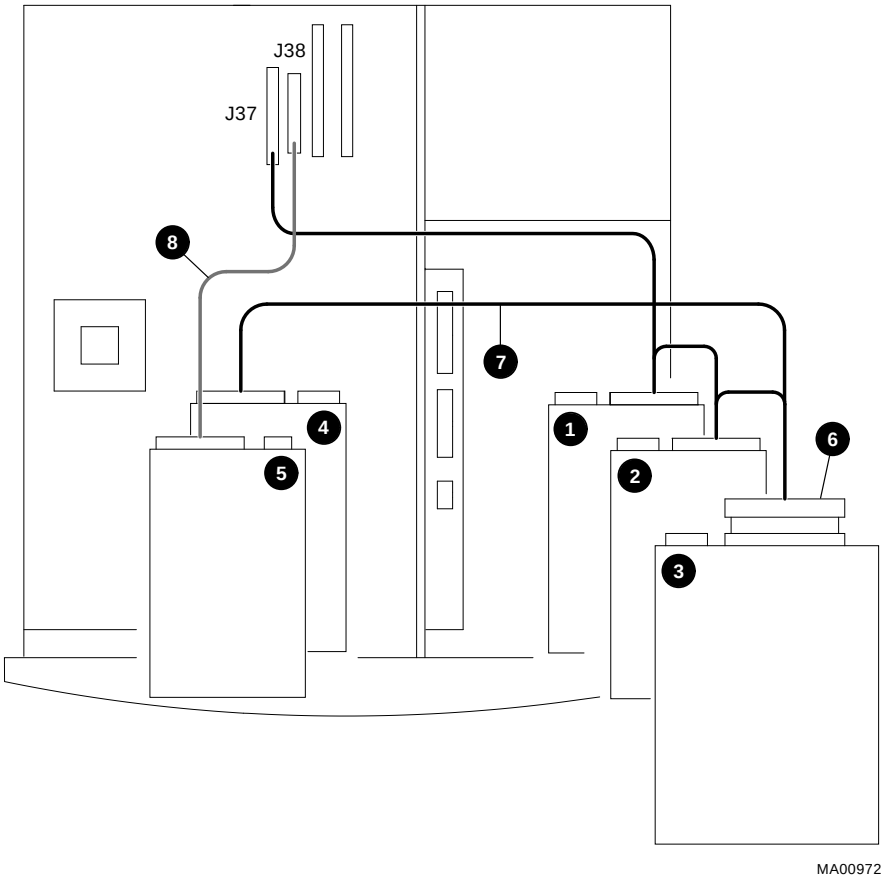


Figure 3-11 FDI/SCSI Cable Routing

❶ Optional 3.5 inch x 1.6 inch SCSI disk ***or*** optional 3.5 inch x 1.0 inch SCSI disk *****
❷ Optional 3.5 inch x 1.0 inch SCSI disk *****
❸ CD-ROM Drive
❹ Optional Slimline 3.5 inch x 1 inch SCSI disk (not available with tape drive option)
❺ Floppy diskette drive or optional tape drive
❻ Adapter for SCSI Cable (Wide to Narrow)
❼ SCSI Cable
❽ FDI Cable (Floppy Drive Interconnect)

***RULE: Use only one 3.5 inch x 1.0 inch device, or two 3.5 inch x 1.0 inch devices or one 3.5 x 1.6 inch device. Do not mix a 3.5 inch x 1.0 inch and a 3.5 inch x 1.6 inch device in this storage tray.**

NOTE

- In Figure 3-11 please note that on the FDI cable ❽, there is a drive end and a controller end. You must check the label on the cable to insure correct orientation. Make sure drive end is connected to drive, controller end connected to system board connector (J38).

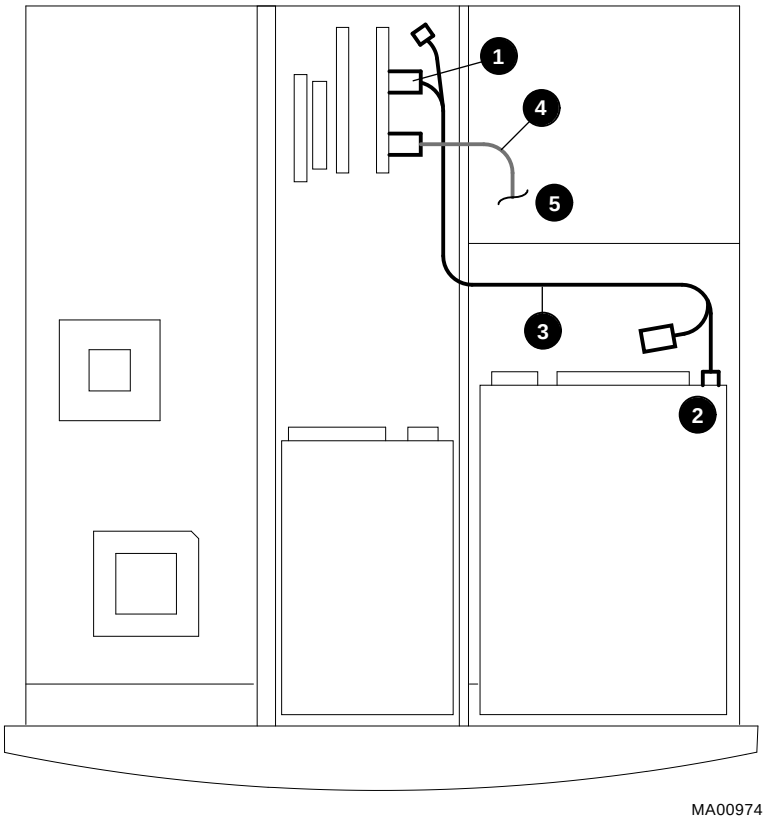


Figure 3-12 Audio Cable Routing

❶ Audio Card Left and Right LINE IN from CD-ROM
❷ CD-ROM Left and Right LINE OUT
❸ CD-ROM Audio Cable
❹ Cable to Internal speaker
❺ Cable connects to internal speaker, located in front panel.

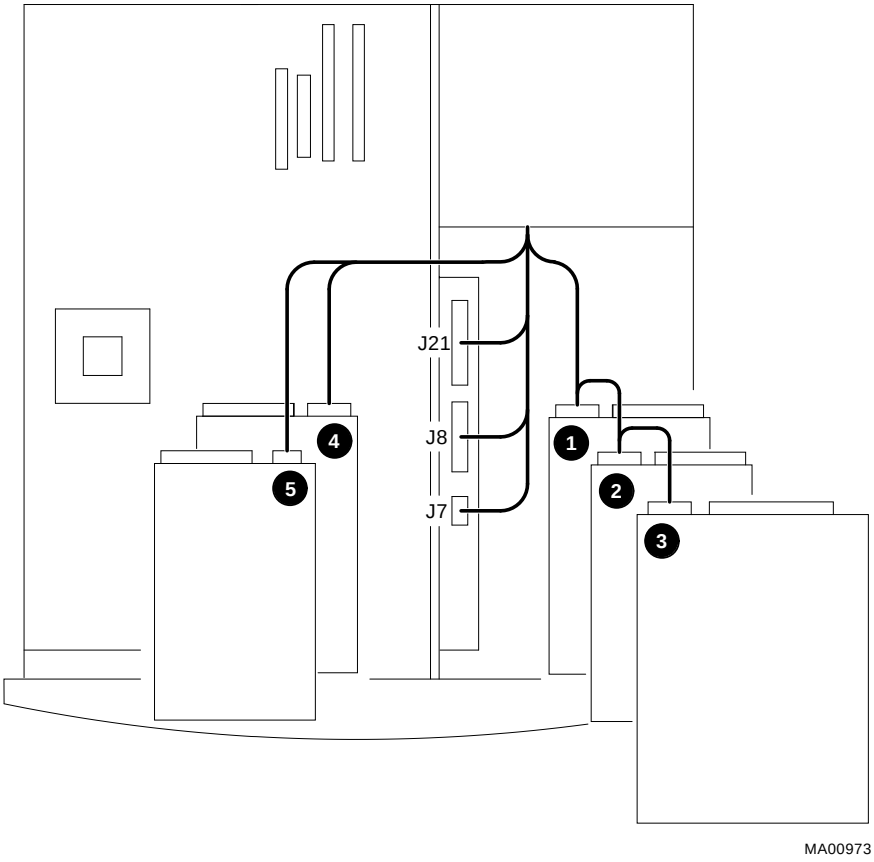


Figure 3-13 Power Cable Configuration

❶ Optional 3.5 inch x 1.6 inch SCSI disk ***or*** optional 3.5 inch x 1.0 inch SCSI disk *****
❷ Optional 3.5 inch x 1.0 inch SCSI disk *****
❸ CD-ROM Drive
❹ Optional Slimline 3.5 inch x 1 inch SCSI disk
❺ Floppy diskette drive

***RULE: Use only one 3.5 inch x 1 inch device, or two 3.5 inch x 1 inch devices or one 3.5 x 1.6 inch device. Do not mix a 3.5 inch x 1 inch and a 3.5 inch x 1.6-inch device in this storage tray.**

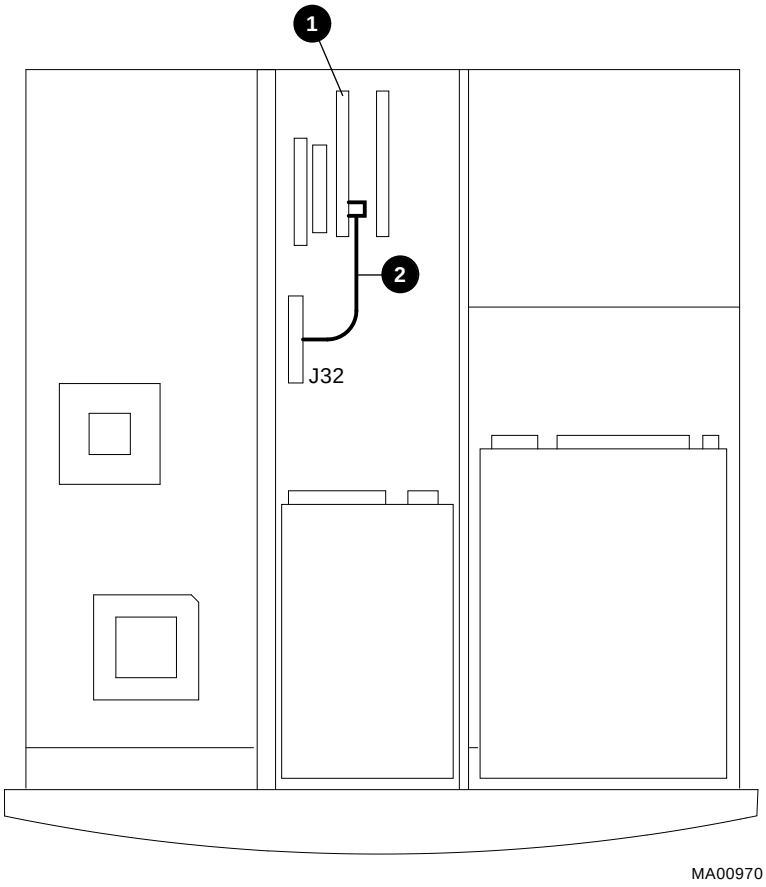


Figure 3-14 MAU Cable Configurations

❶ MAU card (cable connects to MAU card connector J2)
❷ MAU cable (connects to system board connector J32)

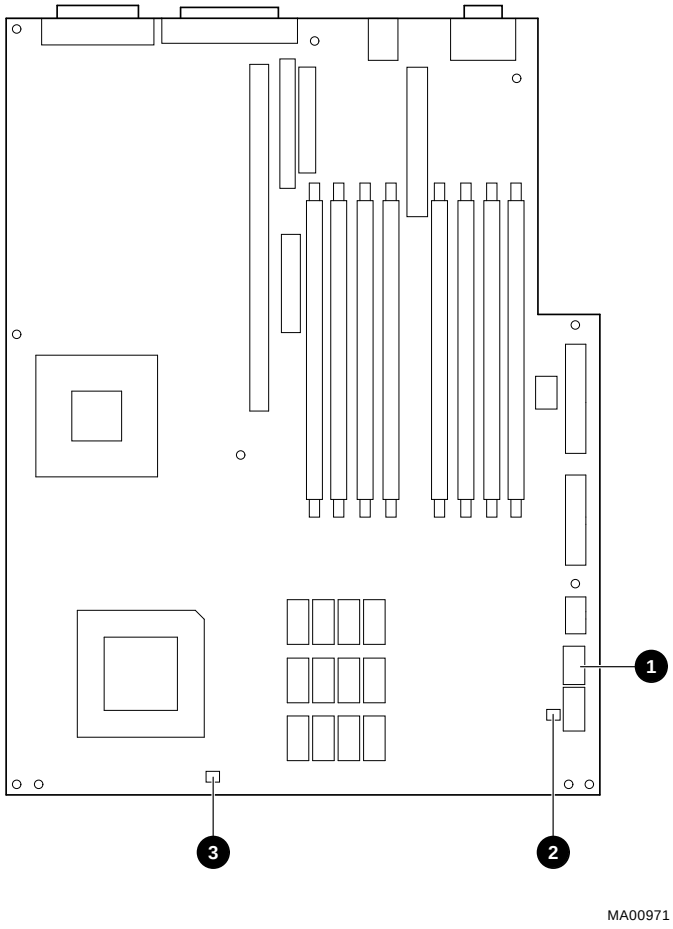


Figure 3-15 Fan and LED Cable Connections

❶ Cable connection for LEDs and Halt/Reset lights (J5)
❷ Cable connection for Cache Fan (J3)
❸ Cable connection for System Fan (J1)

Installing a Hard Disk Drive in the Left Side Storage Bay

An optional 3.5 inch x 1.0 inch hard disk can be installed in the left side storage bay. The drive is installed in the lower position of drive tray that contains the floppy diskette drive. Note that this hard drive is not available with a tape drive option.

To install a hard disk in this bay, follow these procedures:

1. Set the SCSI drive device jumpers or switches for the desired SCSI ID (address). This address depends on the unit numbers currently in use. (See Appendix D, Device Mapping, for a list of typical SCSI ID assignments. Appendix H, Equipment Log, contains space to record your systems SCSI ID assignments.)
2. Follow the guidelines in the manual that came with the drive.

Removing the Floppy Drive Tray Assembly

To remove the floppy drive tray assembly from the system unit, see Figure 3-16 and follow this procedure:

1. Turn off your system and unplug the power cord from the wall outlet.
2. Unlock and remove the top cover panel, as described earlier in this chapter.
3. Push in the tabs ❶ on either side of the rear of the floppy drive tray to release it from the enclosure. Slide the drive assembly ❷ toward the rear of the system unit, lift and remove it.
4. Remove the data and power cables from the devices in the floppy drive assembly. Note the position of the cables so that you can reconnect them to the correct devices later.

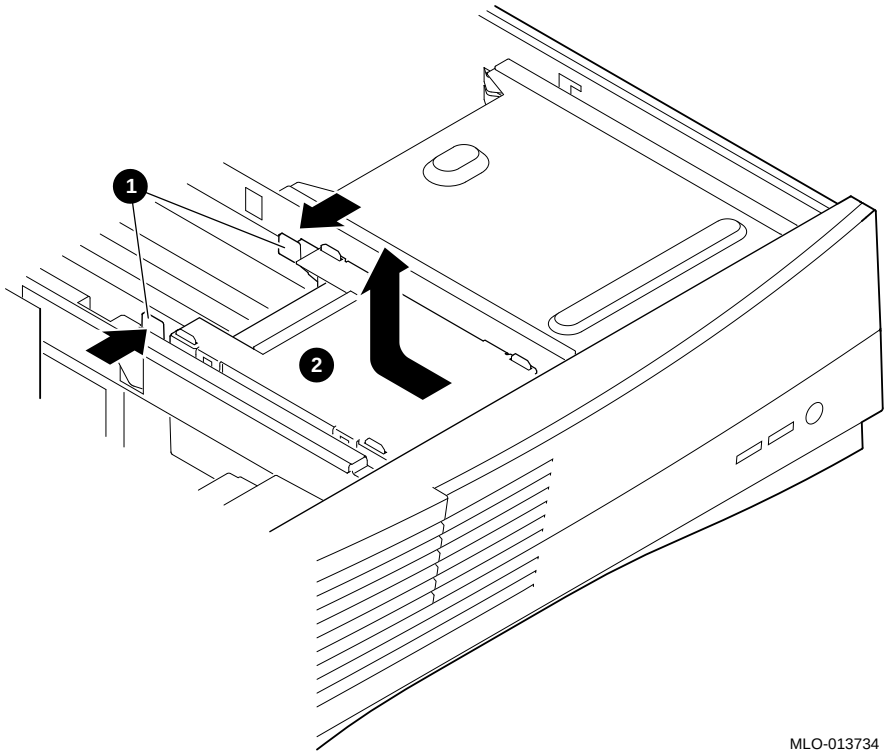


Figure 3-16 Removing the Floppy Drive Tray Assembly

Removing the Floppy Drive from the Original Drive Tray

To remove the floppy from the left side drive tray assembly (original design), see Figure 3-17 and follow this procedure:

1. Remove the four mounting screws ❶ on both sides of the drive. Push back on the clamps ❷ that hold the drive and slide the floppy drive ❸ out of the drive tray assembly.
2. Remove the EMI shield ❹ that is under the floppy drive.

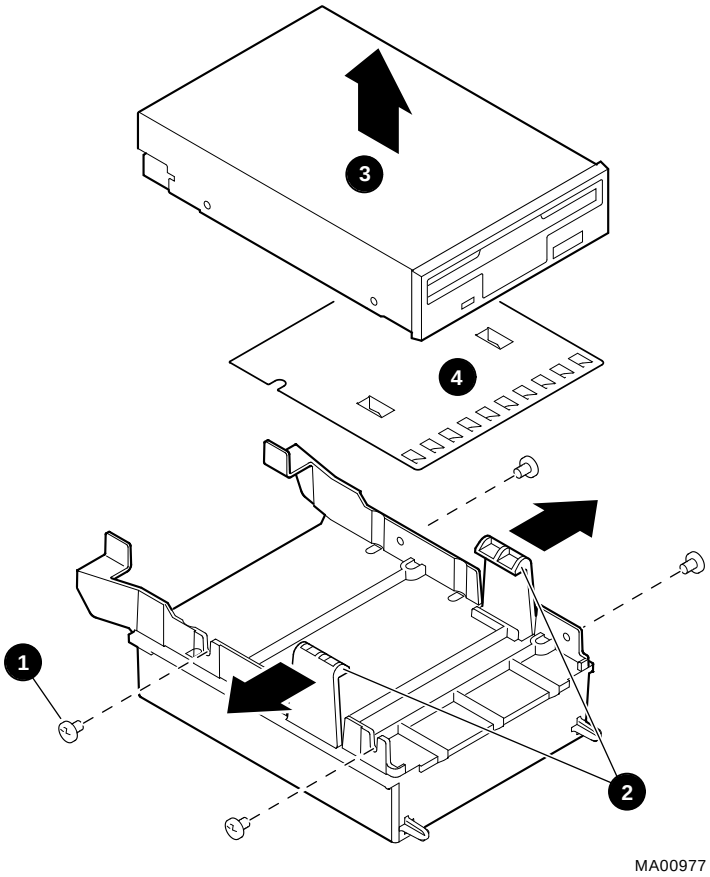


Figure 3-17 Removing the Floppy Drive (Original Tray)

CAUTION

Be sure to use the screws that came with the drive. Other screws may be too long and could damage the internal mechanism of the drive.

Removing the Floppy Drive from the Drive Tray (Re-Designed)

To remove the floppy from the left side drive tray assembly (re-designed), see Figure 3-18 and follow this procedure:

1. Remove the two mounting screws ❶ on both sides of the drive. Slide the floppy drive ❻ out of the drive tray assembly.
2. Remove screws ❸, and the EMI shields ❹ & ❺, that are under the floppy drive.

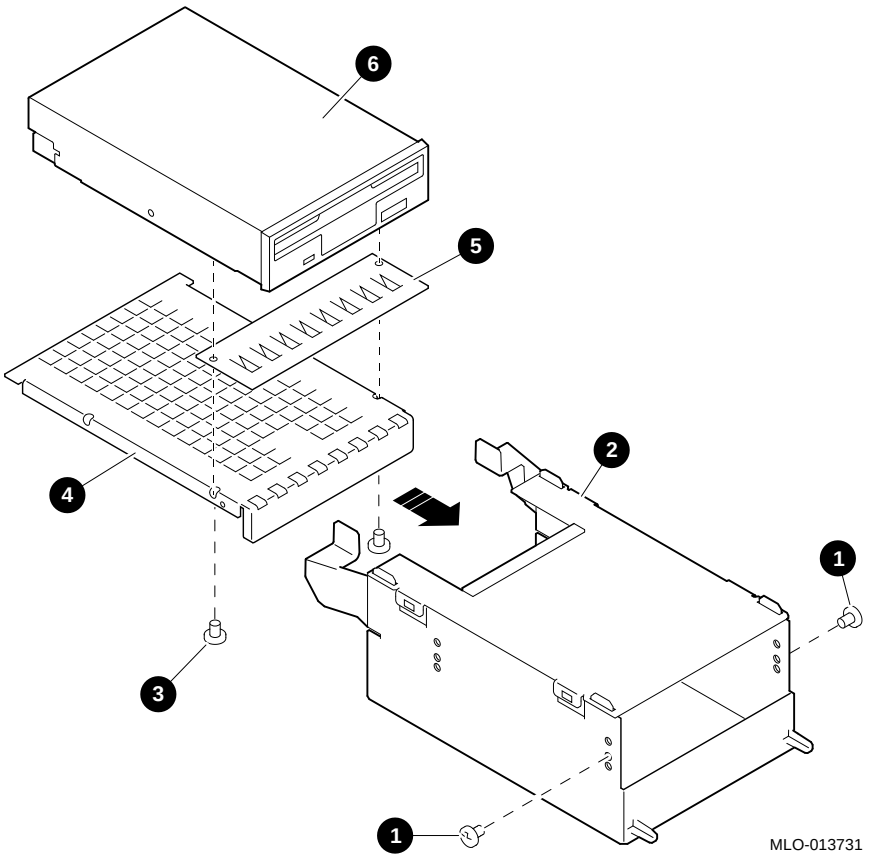


Figure 3-18 Removing the Floppy Drive (Re-designed Tray)

Installing an Optional Hard Drive in the Original Left-side Drive Tray

1. Insert the optional hard drive into the lower position on the drive tray. Secure with the four mounting screws to the drive tray as shown in Figure 3-19.

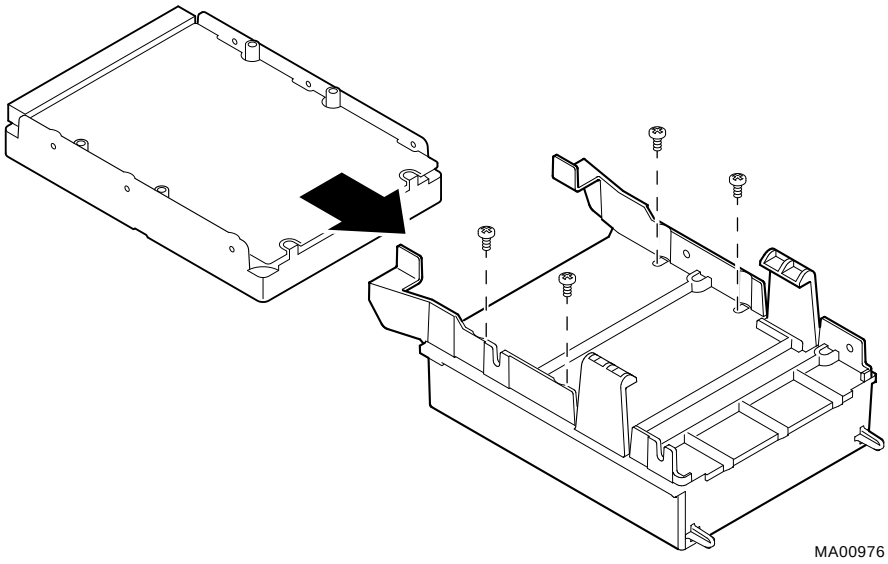


Figure 3-19 Installing the Hard Drive in the Original Left-side Drive Tray

2. Replace the EMI shield and reinstall the floppy drive to the drive tray with the four screws (Figure 3-17).
3. Connect SCSI and power cables. (See Figures 3-10, 3-11, and 3-13)
4. Reinstall the drive tray assembly back into position in the left-side storage bay.

Installing an Optional Hard Drive in the Re-designed Left-side Drive Tray

1. Insert the optional hard drive into the lower position on the drive tray. Secure with the four mounting screws to the drive tray as shown in Figure 3-20.

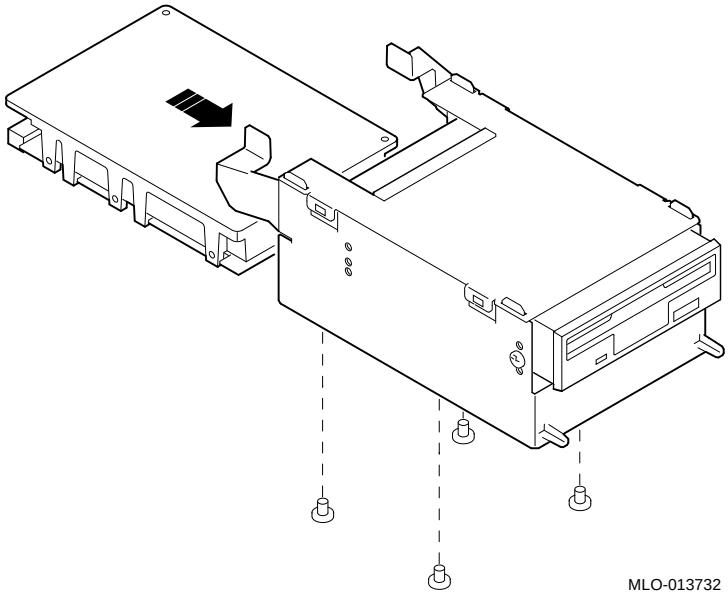


Figure 3-20 Installing Optional Hard Drive (Re-designed Tray)

Installing an Optional Tape Drive in the Redesigned Left-Side Drive Tray

1. Insert the optional tape drive into position in the drive tray as shown in Figure 3-21.
2. Secure with the four mounting screws.
3. Connect SCSI and power cables.

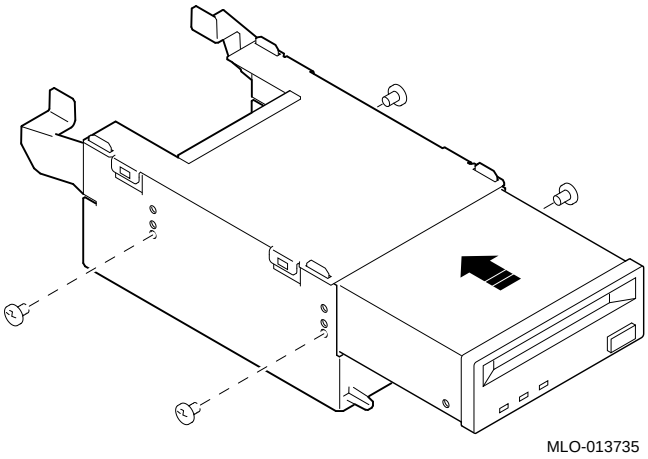


Figure 3-21 Installing a Tape Drive in the Redesigned Left-side Drive Tray

Replacing the Drive Tray Assembly in the System

To replace the drive tray assembly in the system, follow this procedure:

1. Reconnect the SCSI and power cables to the drives.
2. Replace the drive tray assembly in the system unit by sliding it forward until it is properly positioned. Ensure that the two mounting tabs on the drive tray assembly engage the mounting finger and slot in the system unit.
3. Push bracket forward until tabs lock tray in place.
4. Replace and lock the top cover, as described at the end of this chapter.
5. Connect the power cord and plug it into the wall outlet.

PCI Expansion Options

The AlphaStation 500 Series system features four expansion slots, one 64-bit PCI slot, and three 32-bit PCI slots. Refer to Figure 3-22 and Table 3-4.

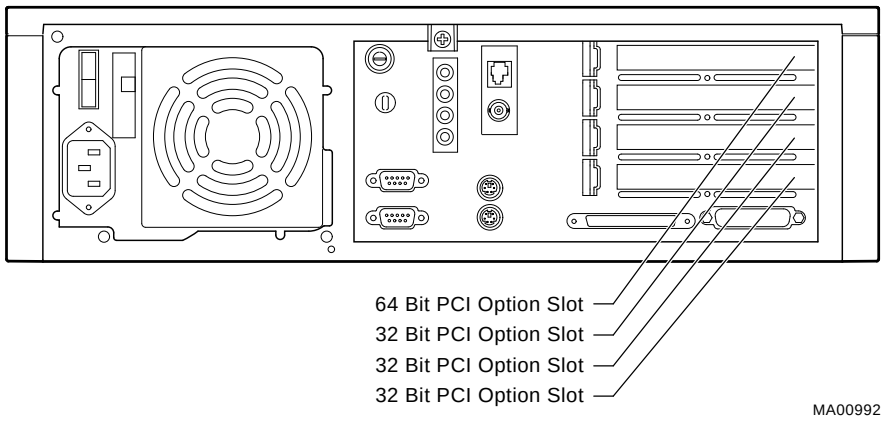


Figure 3-22 PCI Option Slots

Table 3-4 PCI Option Slot Locations

Figure Legend	Components
1	64 Bit PCI Option Slot
2	32 Bit PCI Option Slot
3	32 Bit PCI Option Slot
4	32 Bit PCI Option Slot

PCI Bus

The PCI bus is an industry-standard I/O bus that is the preferred bus for high-performance I/O options. The system supports 32-bit and 64-bit PCI option modules.

☞ PCI option modules require no additional configuration procedures; the system automatically recognizes the modules and assigns the appropriate system resources. Refer to your option module documentation for additional information.

Installing Expansion Modules

To install an expansion module, see Figure 3-23 and follow this procedure:

1. Turn off your system and unplug the power cord.
2. Unlock and remove the top cover and left side panel, as described earlier in this chapter.
3. Pick an available slot for PCI options for your board.
4. Unscrew and remove the metal filler plate for the slot you have chosen.
5. Insert the new expansion module into the socket ❶ in the Riser board. Push the module firmly into the socket.

Note

To ease future installations, it is recommended that PCI options be installed in the bottom PCI slot first.

6. Replace the screw ❷ to secure the module at the rear panel.

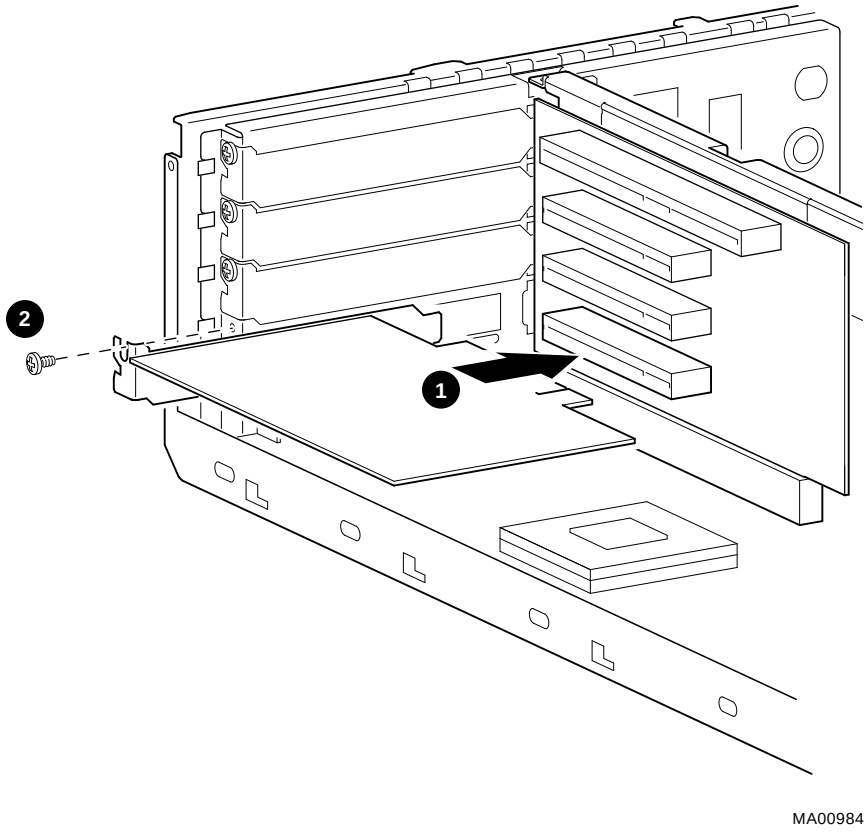


Figure 3-23 Installing an Expansion Module

Replacing the Left Side Panel and Top Cover

To replace the left side panel and top cover, see Figure 3-24 and follow this procedure:

1. To replace the left side panel, line up the 4 locating pins on the bottom of the panel with the slot in the enclosure, push in and slide forward to lock into place.
2. Slide the top cover forward to lock into place. Secure top cover with thumbscrew and lock the top cover. (See Figure 3-24)
3. Connect the power cord and plug it into the wall outlet and turn on the system.

☞ For more information on operating system-specific options, refer to your operating system and option documentation.

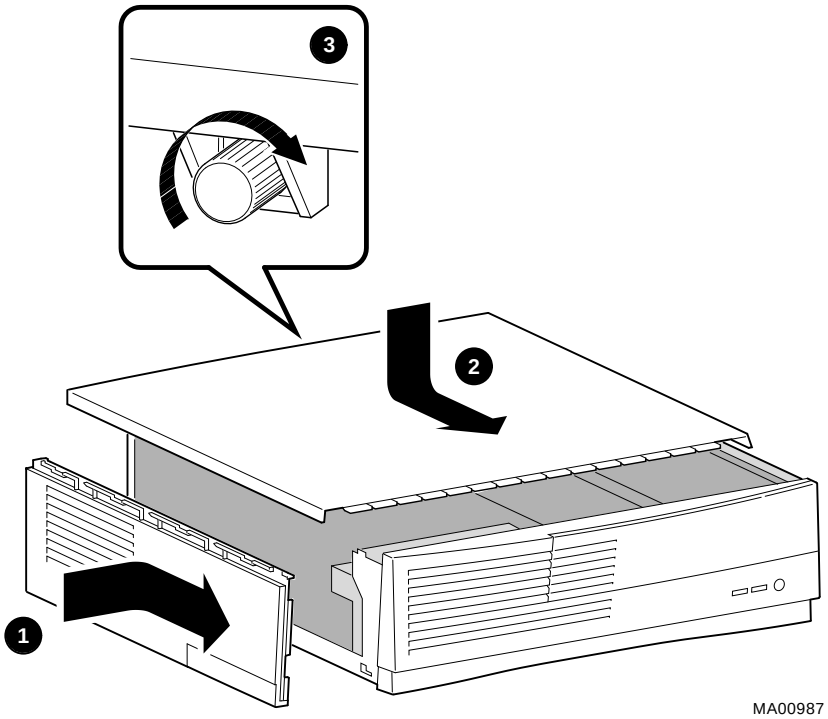


Figure 3-24 Replacing the Top Cover

Connecting External Options

Note

Be sure to read the instructions that come with the printer or SCSI device. If the cable supplied with the printer or SCSI device has the wrong type of connector, you will need an adapter or a different cable.

Connecting a Printer or Other Parallel Device

Connect the cable from the printer or other parallel device to the parallel port on rear panel of the system. (See Figure 2-4)

Connecting an External SCSI Option

To connect an external SCSI device, or a SCSI expansion box, follow these steps:

Set the drive jumpers or switches for the desired SCSI ID.

Connect the option's SCSI cable to the port. Be sure that you use a cable with a wide SCSI 68-pin type connector.

Terminate the new end of the bus at the last external SCSI device, using the appropriate terminator. Make sure that any other external SCSI devices have their terminators removed or disabled.

4
Troubleshooting

Introduction

This chapter describes initial and general troubleshooting as well as the error beep codes.

☞ Refer to the documentation supplied with additional options if you are experiencing problems with specific options that you have installed.

Initial Troubleshooting

To troubleshoot your AlphaStation 500 Series system initially, follow this procedure:

1. Check that the power indicator is on.
2. Check the power indicator on the monitor.
3. Make sure that all cables and connections are secure.
4. Press the Halt/Reset button. If your system fails to boot, turn it off, wait 20 seconds, and turn it back on.
5. Contact your Digital service representative or service provider for software- or hardware-related problems by calling 1-800-354-9000 or 1-800-DIGITAL.

NOTE

If you need to return a failed component, pack it in its original container and return it to Digital Equipment Corporation or to your service provider.

General Troubleshooting

Tables 4-1 through Table 4-4 list how to identify and solve problems that could occur with your system, disk drive, and monitor.

Table 4-1 System Troubleshooting

Problem	Possible Cause	Action
Power indicator not on.	System is not plugged in.	Turn off the system, plug it in, and then turn it back on again.
	No power at the wall outlet.	Use another wall outlet.
	Power supply failure.	Contact your service representative.
	Internal power supply cables not reconnected after installing options.	Reconnect cables.
	Removable side panel not installed properly.	Reinstall removable side panel.
Power is on, but there is no screen display.	Brightness and contrast controls are not correctly set.	Adjust the brightness and contrast controls.
	Monitor is off.	Turn on the monitor.
	Monitor cable or power cord is incorrectly installed.	Check all monitor connections.
	Configuration error. SRM console may be set directly to "Serial."	Set the SRM console to "Graphics." Use the **set console_graphics** command. See pp. A-1 and A-2. Refer to the video module documentation for more information.
	Monitor is defective.	Try another monitor.
	Defective video controller module.	Replace the video module.

Table 4-1 System Troubleshooting (continued)

Problem	Possible Cause	Action
System does not boot	Operating system software is not installed on the hard disk drive.	Install the appropriate operating system.
	System cannot find the boot device.	Check the system configuration for correct device parameters. **Digital UNIX and OpenVMS**: Use the SRM **`show config`** and **`show device`** commands. (Refer to Appendix A, "Console Commands.") Use gathered information to identify target devices for the **`boot`** command and verify that the system acknowledges all installed devices. **Windows NT**: Use the ARC console to display the available boot devices. First, from the Boot menu select **`Supplementary menu...`**; then select **`Display hardware configuration`**. Verify that the target boot device is listed.
	Environment variables incorrectly set.	Check and set the environment variables, if necessary. **Digital UNIX and OpenVMS**: Use the SRM console **`show envar`** and **`set envar`** commands to check and set the values assigned to boot-related variables such as *auto_action*, *bootdef_dev*, and *boot_osflag*. (Refer to Appendix A, "Console Commands.")

Table 4-1 System Troubleshooting (continued)

Problem	Possible Cause	Action
System does not boot. (continued)	Environment variables incorrectly set.	**Windows NT***:* From the Boot menu, select **`Supplementary menu...;`** then select **`Setup the system...`**; then select **`Set default environment variables`**. (Refer to Appendix A, "Console Commands.")
	Hard disk drive is not correctly formatted, or the requested partition does not exist.	Format the hard disk drive or correctly partition the hard disk drive using the supplied software.
	There is no software on the requested partition.	Install software on the requested partition.
System does not boot or powers up for seconds only.	Cache fan, system fan, or internal power supply fan has failed, causing power supply to shut down.	Check all fans for spin. Replace defective fan. Contact your service representative.
Target boot device not listed in **`show device`**, **`show config`** (SRM), or **`Display hardware configuration`** (ARC)	Loose cables.	Secure all cable connections.
	SCSI drive jumpers incorrectly set.	Check all SCSI devices for incorrect or conflicting IDs. Refer to the hard disk drive documentation.
	SCSI bus termination incorrectly set.	Check that the SCSI bus is properly terminated. Refer to Chapter 3 for more information.

Table 4-1 System Troubleshooting (continued)

Problem	Possible Cause	Action
No response to keyboard commands	Keyboard is password-protected.	Enter the keyboard password, if supported by your operating system.
	Keyboard is not connected.	Connect the keyboard to the keyboard port.[3]
	Keyboard is connected to the mouse port.	Connect the keyboard to the keyboard port.[1]
No response to mouse commands	Mouse is not connected.	Connect the mouse.[4]
	Mouse is connected to the keyboard port.	Connect the mouse to the mouse port.[2]
	Mouse driver not installed.	Install the appropriate mouse driver. Refer to your application software documentation.
	Mouse ball sticking.	Clean the mouse. Refer to Appendix B, System Care, for information on cleaning the mouse.

[3]Turn the system off before connecting the keyboard.

[4]Turn the system off before connecting the mouse.

Table 4-2 Disk Drive Troubleshooting

Problem	Possible Cause	Action
Hard disk drive cannot read or write information	Incorrect disk drive jumper settings.	Refer to the disk drive installation instructions.
	Loose or incorrectly installed cables.	Make sure all cables are correctly installed.
	SCSI hard disk drive is not correctly formatted or partitioned.	Format and partition as required using the supplied operating system.
Diskette drive cannot read or write information.	Diskette is not formatted.	Format the diskette.
	Diskette is wrong density.	Use a diskette of the proper density for your drive.
	Diskette is worn or damaged.	Try another diskette.
	Diskette is write-protected.	Slide the write-protect switch so the hole is not visible.
	Diskette drive is empty.	Insert a diskette.

Table 4-3 Monitor Troubleshooting

Problem	Possible Cause	Action
Monitor power indicator is not on	Monitor is turned off.	Turn on the monitor.
	Power cord is not connected.	Connect the power cord to the system or a wall outlet.
	No power at wall outlet.	Use another outlet.
	Power indicator is defective.	Contact your service representative or Digital Equipment Corporation.
Distorted, rolling, or flickering screen display, or wrong or uneven color	Monitor incorrectly adjusted.	Adjust accordingly.
	Wrong type of monitor.	Try another monitor.
	Defective monitor.	Try another monitor.
	Monitor signal cable incorrectly installed.	Straighten any bent connector pins and then reconnect the monitor.

SROM Status and Error Codes

Table 4-4 shows status and error codes you may encounter while using the AlphaStation 500 Series system.

Table 4-4 Status and Error Codes

Status Code	Meaning
DF	Power on, SROM program entered, beginning to initialize EV5 CPU
DE	Initializing cpu/system interface, Sizing MemorySizing, configuring third level cache and MMB data path
DD	Sizing CPU speed
DC	Sizing and initializing the scache
DB	Initializing and testing the PCI bus, testing PCI bus data path
DA	Sizing the bcache
D9	Sizing memory
D8	Configuring memory
D7	Initializing memory test
D6	Testing bcache bits
D5	Testing memory bits
D4	Testing bcache addresses
D3	Testing memory addresses
D2	Testing bcache cells
D1	Testing memory cells
D0	Initializing all memory
CF	Loading flash ROM code
CE	Reinitializing cpu/system interface
CD	Code execution complete

Table 4-4 Status and Error Codes (continued)

Nonfatal Error Code	Meaning
EE	No bcache size bits detected
EB	Failed to detect CPU speed
E9	Failed to detect real-time clock; system defaults to 300 Mhz, providing the most relaxed operating parameters
E4	Memory datapath error. If there is no more memory to reconfigure after the offending bank has been mapped out, error code FA will be displayed (See FATAL errors).
E3	Memory address line error; system maps out the offending bank and reconfigures without it. If there is no more memory to reconfigure after the offending bank has been mapped out, error code FA will be displayed (See FATAL errors).
E2	Bcache cell error
E1	Memory cell error
E0	ROM checksum error
Fatal Error Code	**Meaning**
FF	No scache bits set in sc_ctl register
FD	Floppy drive error
FC	No MMBs, or MMB mismatch *
FB	Reserved
FA	NO usable memory detected, or all detected memory fails the memory tests
F9	Sys init failure — read/write miscompare in one of the control/status registers
F8	PCI data path error
F7	pceb init failure
F6	System finds a bad CIA memory csr
F5	Bcache data path error
F4	Bcache address line error
F3	Bcache cell error
F2	Reserved
F1	ROM data path read error
F0	Reserved

* AlphaStation 500 Series have no MMB's, this is a message for AlphaStation 600 Series.

Equipment Log

For your convenience, Appendix H includes a form on which you may record all model numbers and serial numbers for your hardware components (system unit, monitor, keyboard, and mouse) and system hardware configuration information (CPU, memory size, drive size, ports, and so on).

A
Console Commands

Introduction

The AlphaStation 500 Series system contains two console subsystems:

- Advanced RISC computing (ARC) firmware that supports the Windows NT operating system
- System reference manual (SRM) firmware that supports the Digital UNIX and OpenVMS operating systems

The console firmware resides in 1MB of flashROM on the system board. FlashROM memory can be updated in the field.

This appendix gives a basic description of commands for each console.

ARC Console

The ARC console supports the use of the Windows NT operating system. The ARC console uses a menu interface. When an AlphaStation 500 Series system with Windows NT is turned on, a menu similar to the following displays after initialization:

```
ARC Multiboot Alpha AXP Version 4.xx
Copyright (c) 1993 - 1995 Microsoft Corporation
Copyright (c) 1993 - 1995 Digital Equipment Corporation

Boot menu:

 Boot Windows NT
 Boot an alternate operating system
 Run a program
 Supplementary menu...
```

Use the arrow keys to select, then press **Enter**.
During initialization, the firmware checks the information stored in the nonvolatile memory. If the information is unreadable or inconsistent, a warning message displays. The warning message identifies the areas that must be fixed prior to booting Windows NT.

Commands You Need to Know

The sections that follow describe ARC console commands that you need to know.

Display Hardware Configuration

The **Display hardware configuration** command is located in the Supplementary menu. Use this command to display information about:

- Devices detected (and supported) by the ARC console
- Alpha AXP processor revision, speed, and physical memory size
- Video option detected
- PCI slots, including vendor, revision, and device type

Set Default Environment Variables

The **Set default environment variables** command is located in the Setup menu. Use this command to specify the location of the default system partition. For example, when the partition is on a SCSI hard disk, you are prompted for the SCSI bus number, the SCSI ID of the drive, and the partition number. These values set an environment variable. Windows NT uses the environment variable to determine the correct drive and partition to boot from.

You must know your disk configuration before performing these steps. If you are unsure about your disk configuration, select **Display hardware configuration** from the **Supplementary menu**. (See the previous section.)

1. When the ARC boot menu appears, select **Supplementary menu**, and press **[Enter].** Select **Set up the system** . . . and press **[Enter].**
2. Select **Set default environment variables** and press **[Enter].**
3. For the system partition location, select **SCSI Hard Disk** and press **[Enter].**
4. Enter the SCSI bus number (typically, 0) and the SCSI ID of the disk where the partition resides.

Note

If you are unsure about the environment values, accept the default values of 0. If these values are incorrect for your system, (for example, if your hard disk drives are on a SCSI bus 1, through a secondary controller), Windows NT setup will prompt you to run the ARCINST utility. The ARCINST utility provides valid values that you can use to set this environment variable correctly. (Refer to Appendix E for information on running the ARCINST utility.)

5. Enter the partition number on the disk, which should be 2, and press [Enter].

Set Default Configuration

The **`Set default configuration`** command is located in the Setup menu. Use this command to select:

- Monitor resolution
- Diskette drive capacity
- Keyboard language
- SCSI controller (host) ID (typically, 7)
- EISA bus configuration

For example, when selected, the **`Set default configuration`** command prompts you to make the following choices:

```
Select monitor resolution:
      1280x1024
      1024x768
      800x600
      640x480

Select first floppy drive capacity:
      5.25" 1.2MB
      3.5" 1.44MB
      3.5" 2.88
      none
```

```
Select second floppy drive capacity:
      5.25" 1.2MB
      3.5" 1.44MB
      3.5" 2.88
      none
Select keyboard:
      U.S.              101-key keyboard
      Japanese          106-key keyboard
      French            102-key keyboard
      German            102-key keyboard
      Spanish           102-key keyboard
      Spanish           variation
      Canadian/French   102-keyboard
      Swiss             102-key keyboard
      Italian           102-key keyboard
      Finnish/Swedish keyboard
      Norwegian keyboard
      Danish            102-key keyboard
      U.K.              102-key keyboard
Enter SCSI Host ID (0 - 7) for SCSI bus number 0: 7
```

Setting the Date and Time

The **Set system time** command is located in the **Setup menu**. Use this command to set the system's date and time.

Selecting a Default Language

The first time power is applied after updating the ARC console firmware, you are prompted to select a default ARC console language.

1. At the **Set system language menu**, select either **English** or **Other language** as appropriate. If you selected English, your Alpha system displays the **Boot menu** (or the **Setup menu** if you selected the **Set system language** command from there), and you have completed this task.

If you selected **Other language,** you are prompted for the location of the message and font files. Go to step 2.

2. Insert the diskette or CD-ROM containing the ARC console firmware message and font files into a drive. If the files are located on your hard disk, go to step 3.
3. Select either **Floppy disk**, **CD-ROM**, or **Hard Disk** as appropriate, and press [Enter]. The languages available are displayed on the screen.
4. At the **Language menu**, select the language of your choice and press [Enter].
5. The screen clears and you are asked if you would like to save the language files to hard disk. Select **Yes** and press [Enter].
6. You are prompted to choose a location on the hard disk for the language files. (A default location is selected.) Press [Enter] to accept the default; otherwise, select **Alternate Hard Disk location** and press [Enter].

Edit the partition and the directory location to indicate where you wish to store the language files, then press [Enter]. The language files are copied to the hard disk, and the ARC **Boot menu** appears in the language you selected.

Note

You can also change the default language at the other time by selecting **Set up the system**, then selecting **Set system language**, and following the prompts.

Manage Boot Selection Menu

You reach the Boot selection menu by selecting **Manage boot selection menu** from the Setup menu. Use the Boot selection menu to add, change, check, delete, dump (list), and rearrange boot selections.

Initially, select **Add a boot selection**. You are then prompted to select:

- A system partition for this boot selection. (The partition defined by the **Set default environment variables** command should be one of your choices.)

```
Select a system partition for this boot selection.

SCSI  Bus 0  Hard Disk 0  Partition 2

New System Partition
```

(The partition defined by the **Set default environment variables** command must be one of the available choices.)

- The osloader directory and name.

Enter the osloader directory and name:

\os\winnt\osloader.exe

- Whether or not the operating system is in the same partition as the osloader.

 Is the operating system in the same partition as the osloader:

 Yes

 No

- The operating system root directory.

 Enter the operating system root directory: \winnt

- A name (identifier) for this boot selection.

 Enter a name for this boot selection: Windows NT

- Whether or not the debugger should be initialized at startup time.

 Do you want to initialize the debugger at boot time?:

 Yes

 No

After you add a boot selection, use the **Check boot selections** command to perform verification testing of the selections. If the system detects an error, it prompts you to ignore, delete, or change the boot selection.

Along with adding boot selections, the Boot selections menu allows you to:

Change a boot selection

Check boot selections

Delete a boot selection

Dump boot selections

Rearrange boot selections

Machine Specific Setup

You reach the Machine specific setup menu from the Setup menu. Use this menu to control PCI parity checking, which is (by default) set to On, and SCSI termination of the external portion of the SCSI bus, which is (by default) set to Internal.

Setting PCI Parity

PCI parity is controlled for the **Machine Specific Setup menu**. The setting controls PCI parity checking at the PCI bridge chip. The new value becomes effective after an inti or power cycle.

From the **Machine Specific Setup menu**, select the appropriate line and press [Enter]. The **"*"** shows which parity mode is selected.

```
(  ) PCI parity checking enabled

(  ) PCI parity checking disabled
```

When you enable parity checking, the following message is displayed:

```
Certain PCI adapters have been known to generate bad parity on
the PCI, resulting in system errors.

Please ensure that your specific PCI configuration will
operate correctly prior to turning on parity checking.

Are you sure you want to do this?

      Yes

      No
```

Boot (Boot Selection Identifier)

The **Boot** command is the first selection in the Boot menu. Use this command to start up Windows NT using the default boot selection identifier (which is specified in the Boot selection menu). The default boot selection identifier is the one at the top of the list. You can change the order of the list by selecting the **Rearrange boot selections** command from the **Boot selection** menu.

Boot an Alternate Operating System

The **Boot an alternate operating system** command is located in the Boot menu. Use this command to select a boot selection identifier that is different from the default selection. For example, if you have multiple versions of Windows NT installed, each with its own unique boot selection identifier, use this command to select the version you want to boot.

Other Commands of Interest

The sections that follow describe ARC console commands that you may find useful.

Setup Autoboot

The **Setup autoboot command** is located in the Setup menu. Use this command to enable automatic booting of the system. When you enable autoboot, you will also be

prompted to enter a countdown value (10 seconds is the default). The ARC console will wait for the duration of the countdown value before booting the system.

Install New Firmware

The **`Install new firmware`** is located in the Supplementary menu. Use this command to install firmware upgrades. When selected, the diskette drive and CD-ROM will be checked for the firmware update tool. If the proper media is not present, this command will time out. Follow the instructions packaged with the firmware update. (Also refer to Appendix E, Updating System Firmware.)

Install Windows NT from CD-ROM

The **`Install Windows NT from CD-ROM`** command is located in the Supplementary menu. You must put the Microsoft Windows NT CD into the CD drive before selecting this command.

Switch to OpenVMS or Digital UNIX Console

The **`Switch to OpenVMS or Digital UNIX console`** command is located in the Setup menu. Use this command to select the operating system console that should be launched at the next power cycle.

SRM Console

The SRM console supports the Digital UNIX and OpenVMS operating systems. The SRM console offers many different commands. For a complete list of SRM commands, type **`help`** at the SRM prompt (**`>>>`**). This section describes environment variables and the following commands:

- **`boot`**
- **`set`**
- **`show`**
- **`examine`**
- **`deposit`**

SRM Console Conventions

Table A-1 lists SRM console conventions.

Table A-1 SRM Console Convention

Item	Convention
Console prompt	**>>>**
Continuation line prompt	**_>**
Maximum command length	255 characters.
Multiple contiguous spaces or tabs	Treated as a single space.
Command abbreviations	Allowed, if not ambiguous.
Command qualifiers or options	Prefix with a space and a dash (-).
Numbers	Hexadecimal, unless otherwise specified. (Note: Registers such as R0–R31 are shown in decimal notation.)

SRM Console Shortcut Keys

Table A-2 lists SRM console shortcut keys and their functions.

Table A-2 SRM Console Shortcut Keys

Shortcut Key	Function
Return	Terminates command line input.
← Backspace	Deletes the previously typed character.
[Ctrl]+[A]	Toggles insert/overstrike mode. (Overstrike is the default.)
[Ctrl]+[B], ↑, or ↓	Recalls previous commands. (The last 16 commands are stored.)
[Ctrl]+[C]	Terminates the foreground process.
[Ctrl]+[D] or ←	Moves the cursor left one position.
[Ctrl]+[E]	Moves the cursor to the end of the line.
[Ctrl]+[F] or →	Moves the cursor right one position.
[Ctrl]+[H]	Moves the cursor to the beginning of the line.
[Ctrl]+[O]	Suppresses/resumes (toggles) console output.
[Ctrl]+[Q]	XON, resumes the flow of data to the console.
[Ctrl]+[S]	XOFF, stops the flow of data to the console.
[Ctrl]+[U]	Deletes the entire line.
[Ctrl]+[R]	Retypes the current command line.

Boot Command

The **boot** command performs the following functions:

- Initializes the processor
- Loads a program image from the specified boot device
- Transfers control to the loaded image

The syntax of the boot command is:

boot [-file <*filename*>] [-flags <*longword*>[,<*longword*>]] [-protocols <*enet_protocol*>] [-halt] [<*boot_device*>]

where:

Command Option	Description
-file <*filename*>	Specifies the name of a file to load into the system. For booting from Ethernet, this name is limited to 15 characters. Use the **set_boot_file** command to set the environment variable that specifies a default boot file.
-flags <*longword*>[,<*longword*>]	Specifies additional information for the operating system. For systems with OpenVMS, root number and boot flags are specified here. For Digital UNIX systems, the following flag parameters may be used: **i** = interactive boot **s** = boot to single user **a** = autoboot to multi-user Use the **set_boot_osflags** command to set an environment variable that specifies a default boot flag value.
-protocols <*enet_protocol*>	Specifies the Ethernet protocol(s) that will be used for a network boot. Values may be **mop** or **bootp**.
-halt	Forces the bootstrap operation to halt and invoke the console program after the image is loaded and the page tables and other data structures are set up.
<*boot_device*>	Specifies a device path or list of devices that the firmware will attempt to boot. Use the **set_bootdef_dev** command to set an environment variable that specifies a default boot device.

Boot Command Examples

Table A-3 shows **boot** command examples and their descriptions.

Table A-3 Boot Command Examples

Command	Description
>>>boot	Boots the system from the default boot device.
>>>boot ewa0	Boots the system from Ethernet port ewa0.
>>>boot -file dec2.sys mke0	Boots the file named **dec2.sys** from Ethernet port mke0.
>>>boot -protocol bootp eza0	Boots using TCP/IP BOOTP protocol from Ethernet port eza0.
>>>boot -flags 0,1	Boots the system from the default boot device using flag settings 0,1.
>>>boot -halt dka0	Loads the image from disk dka0, but remains in console mode.

Set Command

The **set** command is used to set or modify the value of an environment variable. Environment variables are used to pass configuration information between the console and the operating system.

The syntax of the set command is:

set <*envar*> <*value*> [-default] [-integer] [-string]

where:

Command Option	Description
<*envar*>	The environment variable to be assigned a new value.
<*value*>	The value that is assigned to the environment variable. It can be either a numeric value or an ASCII string.
-default	Restores an environment variable to its default value.
-integer	Creates an environment variable as an integer.
-string	Creates an environment variable as a string.

Set Command Examples

Table A-4 shows **set** command examples and their descriptions.

Table A-4 Set Command Examples

Command	Description
>>>set bootdef_dev ewa0	The default boot device is set to ewa0.
>>>set auto_action boot	The console will attempt to boot following an error, halt, or power cycle.
>>>set boot_osflags 0,1	The default boot flags are set to 0,1.
>>>set foobar 5	An environment variable called **foobar** is created and given a value of 5.
>>>set os_type NT	Sets up the system to start the ARC console after the next power cycle.

Show Command

The **show** command displays the current value of a specified environment variable. The **show** command also displays information about the system, according to the arguments entered.

The syntax of the **show** command is:

show [{config, device, hwrpb, memory, pal, version, <*envar*>...}]

where: Command Option	Description
config	Displays the current memory configuration, PCI logical slots, and ISA logical slots (based on ISACFG utility input to the configuration database).
device [*device name*]	Displays the devices and controllers in the system. Specifying a device name returns information on that device only.
<*envar*>	Displays the value of the environment variable specified.
error	Displays error log information.
memory	Displays the memory module configuration.
pal	Displays the version of OpenVMS and Digital UNIX PALcode.
version	Displays the version of the console firmware.

Show Command Examples

Table A-5 lists **show** command examples and their descriptions.

Table A-5 Show Command Examples

Command	Description
>>>show device **dka0.0.0.6.0 DKA0 RZ26L 441A** **dka400.4.0.6.0 DKA400 RRD43 3213** **dva0.0.0.0.1 DVA0** **ewa0.0.0.12.0 EWA0 08-00-2B-E2-1C-25** **pka0.7.0.6.0 PKA0 SCSI Bus ID 7**	Lists device information, such as system designation, drive model, or Ethernet address.
>>>show memory **Memory Size = 288Mb** **Bank Size/Sides Base Addr Speed** **02 032Mb/1 010000000 Slow SIMM set mismatch** **03 256Mb/2 000000000 Fast** **BCache Size = 4Mb** **Tested Memory = 288Mbytes**	Lists system RAM, bank sizes, starting addresses, and versions of SROM.
>>>show * (Refer to the next section.)	Lists all variables and their settings.
>>>show boot* (Refer to the next section.)	Lists all variables beginning with boot.

Environment Variables

Table A-6 shows selected environment variables and their descriptions. For a complete list, type **`show *`** at the SRM prompt.

Table A-6 Environmental Variables

Variable	Description
`auto_action`	Sets/shows the console action following an error, halt, or power-cycle. The action can be halt, boot, or restart. Halt is the default.
`boot_file`	Sets/shows the file name to be used when a bootstrap requires a file name. The default setting is null.
`boot_osflags`	Sets/shows additional parameters to be passed to system software. When using OpenVMS software, these parameters are the system root number and boot flags. The default setting is 0,0.
`bootdef_dev`	Sets/shows the default device or device list from which the system will attempt to boot. If the system software is preloaded, the variable is preset to point to the device containing the preloaded software. Otherwise, the default value is null.
`console`	Sets the console output to either serial port or the graphics controller.
`os_type`	Sets/shows the specified operating system (NT, OpenVMS, or Digital UNIX) that nonvolatile random-access memory (NVRAM) will boot.
`pci_parity`	Controls PCI parity checking at the PCI bridge chip. Parity checking is performed if on, disabled if off, and dependent on the SCSI controller revision.

Examine Command

The **examine** command displays the contents of an address you specify. The address can be a memory location, register, device, or file.

The syntax of the examine command is:

examine [-{b,w,l,q,o,h,d}] [-{physical, virtual, gpr, fpr, ipr}] [-n <*count*>] [-s <*step*>] [<*device*>:]<a*ddress*>

where:

Command Option	Description
-b	Byte of data.
-w	Word of data.
-l	Longword of data.
-q	Quadword of data.
-o	Octaword of data.
-h	Hexword of data.
-d	Displays data as a decoded macro instruction.
-physical	References physical address space.
-virtual	References virtual address space.
-gpr	References general-purpose register address space.
-fpr	References floating-point register address space.
-ipr	References internal-processor register address space.
-n <*count*>	Specifies the number of consecutive locations to examine.
-s <*step*>	Specifies the address increment as a hexadecimal value. This option allows you to override the increment that is normally derived from the data size.
[<*device*>:]	Selects the device to access.
<*address*>	Specifies the address of the first location to examine within the current device.

Examine Command Examples

Table A-7 shows **examine** command examples and their descriptions.

Table A-7 Examine Command Examples

Command	Description
>>>e r0 **gpr: 0 (R0) 0000000000000002**	Examines R0 using a symbolic address.
>>>e -g 0 **gpr: 0 (R0) 0000000000000002**	Examines R0 using address space.
>>>e gpr:0 **gpr: 0 (R0) 0000000000000002**	Examines R0 using device name.
>>>e pc **PC psr: 0(PC) FFFFFFFF80072954**	Examines the program counter.
>>>examine -n 5 r7 **gpr: 38 (R7) 0000000000000000** **gpr: 40 (R8) 0000000000000000** **gpr: 48 (R9) 0000000000000000** **gpr: 50 (R10) 000000007FFBF800** **gpr: 58 (R11) 000000007FF781A2** **gpr: 60 (R12) 0000000000000000**	Examines R7 and the next five registers.
>>>examine ipr:11 **ipr: 11 (KSP) FFFFFFFF8228DFD0**	Examine internal processor register 11.

Deposit Command

The **deposit** command writes data to an address that you specify. The address can be a memory location, register, device, or file.

The syntax of the **deposit** command is:

deposit [-{b,w,l,q,o,h}] [-{physical,virtual,gpr,fpr,ipr}] [-n <*count*>] [-s <*step*>] [<*device*>:]<*address*> <*data*>

where:

Command Option	Description
-b	Byte of data.
-w	Word of data.
-l	Longword of data.
-q	Quadword of data.
-o	Octaword of data.
-h	Hexword of data.
-physical	Reference physical address space.
-virtual	Reference virtual address space.
-gpr	Reference general-purpose register address space.
-fpr	Reference floating-point register address space.
-ipr	Reference internal-processor register address space.
-n <*count*>	Specifies the number of consecutive locations to deposit.
-s <*step*>	Specifies the address increment as a hexadecimal value. This option allows you to override the increment that is normally derived from the data size.
[<*device*>:]	Selects the device to access. The following devices are supported: • **pmem**: Physical memory • **vmem**: Virtual memory. All access and protection checking will occur.

Command Option	Description
<*address*>	An address that specifies the offset within a device into which data is deposited. The address may also be any legal symbolic address. Valid symbolic addresses are: • ***gpr-name***. Symbol representing general-purpose register • ***ipr-name***. Symbol representing internal-processor register • ***PC***. Program counter • **+.** The location immediately following the last location referenced by an **examine** or **deposit** command. • **-.** The location immediately preceding the last location referenced by an **examine** or **deposit** command. • ***.** The location last referenced by an **examine** or **deposit** command. • **@.** The location addressed by the last location referenced by an **examine** or **deposit** command.
<*data*>	The data to be deposited.

Deposit Command Examples

Table A-8 shows **deposit** command examples and their descriptions.

Table A-8 Deposit Command Examples

Command	Description
>>>d -n 1FF pmem:0 0	Clears the first 512 bytes of physical memory.
>>>d -l -n 3 pmem:1234 5	Deposits 5 into four longwords starting at physical memory address 1234.
>>>d -n 8 R0 FFFFFFFF	Loads GPRs R0 through R8 with -1.
>>>d -l -n 10 -s 200 pmem:0 8	Deposits 8 in the first longword of the first 17 pages in physical memory.

B
System Care

Introduction

This appendix describes how to:

- Clean your system, including the outside enclosure, monitor, mouse, and keyboard
- Move your system

WARNING

Make sure you turn off the system and disconnect any external devices before cleaning any part of your system. When using a moistened cloth for cleaning, do not allow any excess fluid to leak into the system, keyboard, or monitor. Wait until the system is completely dry before applying power.

Cleaning Your System Unit

Clean the outside of the system periodically with a soft cloth lightly moistened with a mild detergent solution. Do not use solvents or abrasive cleaners.

Cleaning Your Monitor

If the monitor screen gets dirty, clean it with a sponge or chamois lightly dampened with a mild detergent solution. Do not use solvents or abrasive cleaners.

WARNING

If you use a prepackaged screen cleaner, make sure that it is *nonflammable*. Never spray the cleaner directly on the screen. Instead, apply the cleaner to a clean cloth, and then clean the screen.

Cleaning Your Mouse

If your mouse does not move smoothly or if the pointer jumps across the screen when you are using the mouse, the ball inside the mouse may need cleaning. To clean the ball, perform the following steps, as shown in Figure B-1.

1. Turn the mouse over ① and remove the plate on the bottom.
2. Remove the rubber ball.
3. Clean the ball and rollers ② with a cotton swab that has been lightly dampened with a mild detergent.
4. Replace the ball and plate ③.

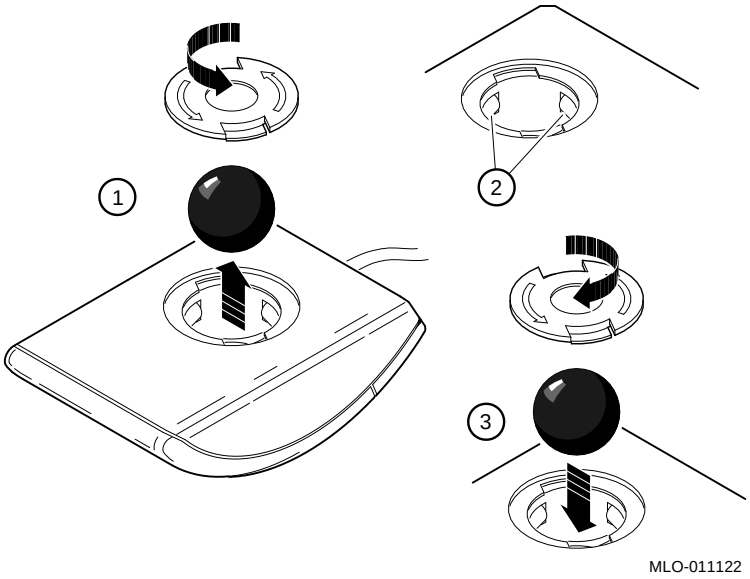


Figure B-1 Cleaning the Mouse

Cleaning Your Keyboard

Your keyboard keys may get dirty with use. Clean them with a clean cloth that has been lightly dampened with a mild detergent solution.

Moving Your System

Perform the following steps before shipping or moving the system:

1. Back up all files stored on the hard disk drive.
2. Turn off the external peripherals, the system, and the monitor.
3. Disconnect the power cord from the wall outlet and from the back of the system unit.
4. Disconnect the monitor, keyboard, mouse, and any other cables from the back of the system unit.
5. Package the system as described in the section on Packing Your System later in this appendix.

WARNING

When packing and moving system components, be aware that some components (such as the system unit or monitor) may be too heavy for you to safely lift alone. If you are doubtful about whether you can lift these items alone, please get assistance.

Packing Your System

If you are moving the system a short distance (for example, from one room to another in the same building), you do not have to pack it. However, if you are shipping the system or moving it by vehicle, pack it in the original packing material and containers. If you did not save the boxes and packing material, use a sturdy carton and cushion the computer well to avoid damage.

Installing Your System at a New Location

After moving the system to a new location, unpack and install it following the installation instructions on the installation information.

C
Technical Specifications

Introduction

This appendix describes the following technical characteristics of the AlphaStation 500 Series system:

- System specifications
- External system connectors
- Expansion slot current limitations
- System current requirements
- System board jumpers

System Specifications

Tables C-1 through C-4 list the AlphaStation 500 Series system processor features, dimensions, environmental specifications, and acoustics specifications.

Table C-1 System Specifications

Attributes	Specification
PCI clock	33 MHz
Data I/O	32/64-bit PCI
System board RAM	Expandable up to 1 GB

Table C-2 System Dimensions

Dimension	Specification
Width	43 cm (17 inches)
Length	46 cm (18 inches)
Height	13 cm (5 inches)
Weight	14.5 kg (32 lb)

Table C-3 System Environmental Specifications

Attributes	Specification
Operating temperature	10°C to 40°C (50°F to 104°F) (without removable media)
Storage temperature	–40°C to 66°C (–40F to 151°F)
Operating humidity (noncondensing)	10% to 90% relative humidity, (without removable media) 20% to 80% relative humidity (with removable media) maximum wet bulb 2°C (36°F)
Storage humidity (noncondensing)	10% to 90% relative humidity, maximum wet bulb 65°C (149°F)
Altitude Operating Nonoperating	 2,438 m (8,000 ft) maximum 4,876 m (16,000 ft) maximum
Shipping vibration	IAW Federal Standard 101, method 5019
Nonoperating shock	30 G, 25 ms halfsine

Table C-4 Acoustics - Declared Values According to ISO 9296 and ISO 7779

Product	Sound Power Level L_{WAd}, B		Sound Pressure Level L_{pAm}, dBA (Operator Position)	
	Idle	Operate	Idle	Operate
PB540-A9 (no disks)	5.3	5.3	42	42
AlphaStation 500 (w/ 2 GB SCSI disk)	5.4	5.4	43	46

NOTE

Current values for specific configurations are available from Digital representatives. 1B=10 dBa.

External System Connectors

This section lists the pin assignments for your system's external connectors.

- Parallel connector: 25-pin D-submini female
- Serial connectors: 9-pin D-submini male (2)
- Keyboard and mouse connectors: 6-pin mini-DIN
- SCSI port, high-density, shielded

Parallel Port Connector

The parallel port connector provides an interface to a printer or other parallel devices. Table C-5 lists pin assignments. An asterisk (*) after a signal name indicates an active low signal.

Table C-5 Parallel Port Pinouts

DB25 Pin	Signal	Function
1	STB-R*	Strobe
2	PRTD0	Printer data bit 0
3	PRTD1	Printer data bit 1
4	PRTD2	Printer data bit 2
5	PRTD3	Printer data bit 3
6	PRTD4	Printer data bit 4
7	PRTD5	Printer data bit 5
8	PRTD6	Printer data bit 6
9	PRTD7	Printer data bit 7
10	ACK*	Acknowledge
11	BUSY	Busy
12	PE	Paper end
13	SLCT	Select
14	AUTOFDXT*	Autofeed
15	ERR*	Error
16	INIT*	Initialize printer
17	SLCTIN*	Select input
18 to 25	GND	Ground

Serial Port Connectors

The serial port connectors consist of two 9-pin D-submini connectors. Table C-6 lists their pin assignments.

The baud rates supported by the system's serial ports are 300, 1200, 2400, 4800, 9600, 19200, and 38400.

Table C-6 9-Pin Port Pinouts

DB9 Pin	Signal	Function
1	DCD	Data carrier detect
2	RXD	Receive data
3	TXD	Transmit data
4	DTR	Data terminal ready
5	GND	Ground
6	DSR	Data set ready
7	RTS	Request to send
8	CTS	Clear to send
9	RI	Ring indicator

Keyboard and Mouse Connectors

The keyboard and mouse connectors consist of two 6-pin mini-DIN connectors. Table C-7 lists their pin assignments.

Table C-7 Keyboard and Mouse Connector Pinouts

Pin	Signal
1	Data
2	Reserved
3	Ground
4	+5V DC (fused)
5	Clock
6	Reserved

SCSI Connectors

There is one SCSI port that exits the AlphaStation 500 Series system unit:

- A 68-pin high-density, wide port that is terminated at the I/O subsystem module A 68-pin high-density, wide port that is terminated at the I/O subsystem module. See Table C-8 for the SCSI pin assignments.
- A narrow adapter (68 to 50 pin) is available for use with a CD-ROM .(Part number is 17-04009-01) See Table C-8 for the SCSI pin assignments.

Table C-8 Wide SCSI Pinouts

Signal Name	Connector Contact Number	Cable Conductor Number		Connector Contact Number	Signal Name
GROUND	1	1	2	35	-DB(12)
GROUND	2	3	4	36	-DB(13)
GROUND	3	5	6	37	-DB(14)
GROUND	4	7	8	38	-DB(15)
GROUND	5	9	10	39	-DB(P1)
GROUND	6	11	12	40	-DB(0)
GROUND	7	13	14	41	-DB(1)
GROUND	8	15	16	42	-DB(2)
GROUND	9	17	18	43	-DB(3)
GROUND	10	19	20	44	-DB(4)
GROUND	11	21	22	45	-DB(5)
GROUND	12	23	24	46	-DB(6)
GROUND	13	25	26	47	-DB(7)
GROUND	14	27	28	48	-DB(P)
GROUND	15	29	30	49	GROUND
GROUND	16	31	32	50	GROUND
TERMPWR	17	33	34	51	TERMPWR
TERMPWR	18	35	36	52	TERMPWR
RESERVED	19	37	38	53	RESERVED
GROUND	20	39	40	54	GROUND
GROUND	21	41	42	55	-ATN

Table C-8 Wide SCSI Pinouts (Continued)

Signal Name	Connector Contact Number	Cable Conductor Number		Connector Contact Number	Signal Name
GROUND	22	43	44	56	GROUND
GROUND	23	45	46	57	-BSY
GROUND	24	47	48	58	-ACK
GROUND	25	49	50	59	-RST
GROUND	26	51	52	60	-MSG
GROUND	27	53	54	61	-SEL
GROUND	28	55	56	62	-C/D
GROUND	29	57	58	63	-REQ
GROUND	30	59	60	64	-I/O
GROUND	31	61	62	65	-DB(8)
GROUND	32	63	64	66	-DB(9)
GROUND	33	65	66	67	-DB(10)
GROUND	34	67	68	68	-DB(11)

Note

In Table C-9, please note that narrow is seen @ CD-ROM only.

Table C-9 Narrow SCSI Pinouts

Signal Name	Connector Contact Number	Cable Conductor Number		Connector Contact Number	Signal Name
GROUND	1	1	2	2	-DB(0)
GROUND	3	3	4	4	-DB(1)
GROUND	5	5	6	6	-DB(2)
GROUND	7	7	8	8	-DB(3)
GROUND	9	9	10	10	-DB(4)
GROUND	11	11	12	12	-DB(5)
GROUND	13	13	14	14	-DB(6)

Table C-9 Narrow SCSI Pinouts (Continued)

Signal Name	Connector Contact Number	Cable Conductor Number		Connector Contact Number	Signal Name
GROUND	15	15	16	16	-DB(7)
GROUND	17	17	18	18	-DB(P)
GROUND	19	19	20	20	GROUND
GROUND	21	21	22	22	GROUND
OPEN	23	23	24	24	OPEN
OPEN	25	25	26	26	TERMPWR
RESERVED	27	27	28	28	RESERVED
GROUND	29	29	30	30	GROUND
GROUND	31	31	32	32	-ATN
GROUND	33	33	34	34	GROUND
GROUND	35	35	36	36	-BSY
GROUND	37	37	38	38	-ACK
GROUND	39	39	40	40	-RST
GROUND	41	41	42	42	-MSG
GROUND	43	43	44	44	-SEL
GROUND	45	45	46	46	-C/D
GROUND	47	47	48	48	-REQ
GROUND	49	49	50	50	-I/O

Expansion Slots

The system board contains one 64-bit PCI (full length), three 32-bit PCI (one full length, two half length). The maximum available +5V DC allowable to any expansion slot depends on the following parameters:

- Power supply capacity
- The +5V DC requirements of the system board
- The +5V DC requirements of the peripherals
- The power demands of all other slots in use and of the system board

Power Supply and Input Power Requirements

The 320-watt power supply provides four DC voltages: +12V, -12V, +5V, and +3.43V DC. These voltages are used by the various components within the system and are listed in Table C-10

Table C-10 Output Power Requirements

DC Outputs	Maximum Load	Maximum Power
+3.4V	35 amps	119 W
+5.0V	45 amps	225 W
+12.0V	14 amps	168 W
-12.0V	0.5 amps	6 W
	Maximum Watts	**260 W**

HINT

The maximum power from any combination of +3.43V and +5.0V does not exceed 260 W.

The AlphaStation 500 Series system has the rated voltage range described in Table C-11

Table C-11 Input Power Requirements

Rated Voltage Range	Rated Input Current	Operating Frequency Range
88V AC–264V AC	8–4 amps	47 Hz–63 Hz

System Board Jumper Locations

Jumper pins allow you to set specific system parameters. Set them by changing the pin location of jumper blocks. A jumper block is a small plastic-encased conductor (shorting plug) that slips over the pins. To change a jumper setting, remove the jumper from its current location with your fingers or small needlenose pliers. Place the jumper over the two pins designated for the desired setting. Press the jumper evenly onto the pins. Be careful not to bend the pins.

Figure C-1 shows the locations of the system board jumper pins. Table C-12 lists the system board jumpers and factory-default settings.

CAUTION

Do not touch any electronic component unless you are safely grounded. Wear a grounded wrist strap or touch an exposed metal part of the system unit chassis. A static discharge from your fingers can result in permanent damage to electronic components

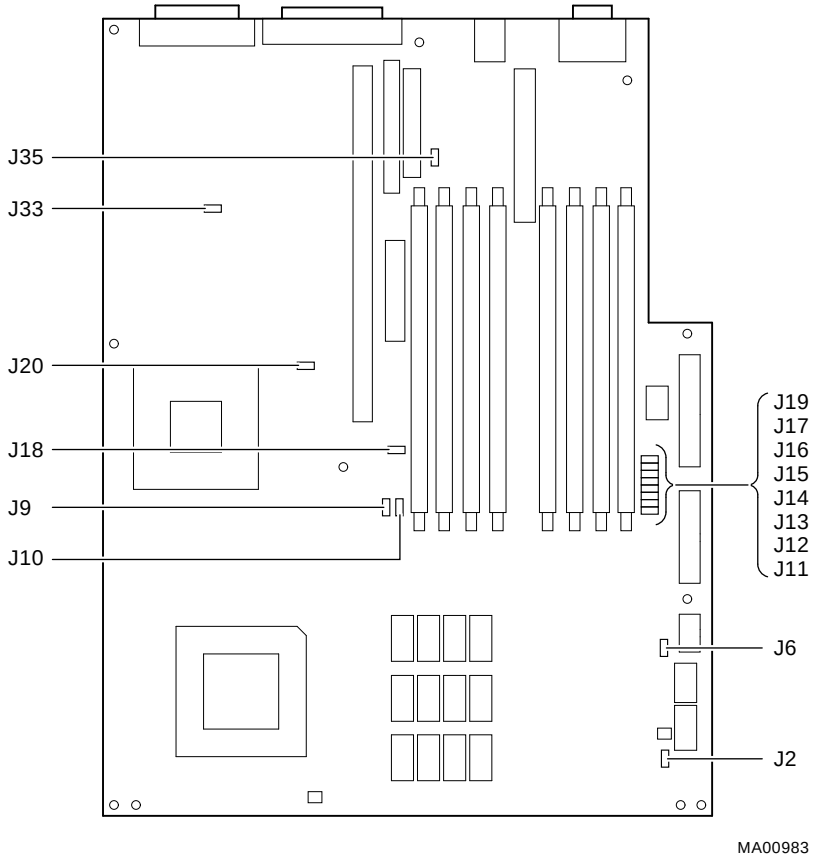


Figure C-1 System Board Jumper Locations

Table C-12 System Board Jumpers

Jumper	Pins 1 to 2	Pins 2 to 3	Function
J6	Reset*	Halt	Changes front push button function
J9	Secure Console Enabled	Secure Console Disabled*	Secure console
J10	Alternate Console Enabled	Primary Console Enabled*	Alternate console
J18	FROM Write Protect	Write Enabled*	Controls 12 volts for the FROM
J2, J20, J33, J35			Ground reference jumpers for debug

(*) = Default position.

SROM Selection Jumpers

SROM jumpers are used for debug purposes by manufacturing and field service. There are eight loadable images in the SROM device. The SROM selection jumpers select which output from the SROM drives the EV5 CPU. Figure C-1 show the SROM selection jumper locations. Table C-13 lists the encoding for the SROM selection jumpers. Only one jumper may be installed at any given moment.

Table C-13 SROM Selection Jumpers

Jumper	SROM Bit	Function
J11	0	Power Up (default)
J12	1	Mini-Console
J13	2	Floppy loader
J14	3	MFG Memtest
J15	4	RESERVED
J16	5	RESERVED
J17	6	MCHK Mini-Console
J19	7	Noinit Mini-Console

Ethernet Interface

The AlphaStation 500 Series system uses a Media adapter unit (MAU) card to support Ethernet connections. This module provides for ThinWire, or twisted-pair Ethernet operation. Refer to Figure 3-3.

Software Switches

Software switches which must be set properly from the console mode. To determine the system setup, type:

```
show ewa0
```

at the >>> prompt. To set the proper mode, type:

```
set ewa0 x
```

where x is equal to either twisted-pair operation (which looks like phone connector) or BNC which is the ThinWire (round coaxial connector).

Selecting the ThickWire/ThinWire or Twisted Pair Ports

Open VMS or Digital UNIX AlphaStation 500 series systems must be told to use the appropriate Ethernet port.

Change the port types by using the following SRM console commands:

>>> set ewa0_mode AUI (for the ThickWire and ThinWire port)

>>> set ewa0_mode twisted (for the ThickWire and ThinWire port)

After changeing the port, type **>>> init** or power cycle the machine. The Windows NT operating system auto-senses which network port is connected.

D
Device Mapping

Introduction

This appendix lists system device mapping information, including:

- I/O address map
- Interrupt map

I/O Address Map

Table D-1 presents information on the I/O address map.

Table D-1 I/O Address Map

ISA I/O Addresses	Devices
0000-02F7	Reserved
02F8-02FF	Serial port 2
03BC-03BE	Parallel port
03BF-03EF	Reserved
03F0-03F7	Diskette drive
03F8-03FF	Serial port 1
0400-07FF	Reserved

Interrupt Map

The (Interrupt Request register) IRQ assignments for the AlphaStation 500 Series are shown in Table D-2; the EISA interrupt assignments are shown in Table D-2. This information is useful when adding or reconfiguring options on your system. Avoid conflicts when assigning IRQs by associating one IRQ to one source. PCI interrupt levels are set either by the operating system (as in Windows NT) or by the SRM console (as in Digital UNIX and OpenVMS).

Table D-2 Main Interrupt Logic IRQ Pin Assignments

Output	IRQ[5]	Interrupt	Usage (Reference Designator)
EV5 IRQ<1>	0 1 2 3	Int A Int B Int C Int D	I/O Riser Slot 2 – 32-bit J-4 PCI Slot 11
	4 5 6 7	Int A Int B Int C Int D	I/O Riser Slot 1 – 32-bit J3 PCI Slot 12
	8 9 10 11	Int A Int B Int C Int D	I/O Riser Slot 0 – 64-bit J-1 PCI Slot 7
	12		SCSI Controller, PCI Slot 9
	13		Ethernet Controller, PCI Slot 6
	15–14		Reserved
	16 17 18 19	Int A Int B Int C Int D	I/O Riser Slot 3 – 32-bit J-5 PCI Slot 8
	23–20		Interrupt Jumpers, See Table D-4.
	27-24		• Module REV
	30-28		Reserved
	31	EISA_INT	8259 INT output

Note: All unmasked IRQ inputs have equal priority.

[5] All unmasked IRQ inputs have equal priority.

Table D-3 EISA Interrupt Assignments

Priority	Label	Controller	Int/External	Interrupt Source
1	IRQ 0	1	Internal	Internal timer 1 counter 0 out
2	IRQ 1		External	Keyboard
3-10	IRQ 2		External	Interrupt from controller 2

Table D-4 Interrupt Jumpers

IRQ	JUMPERS
20	Alternate Console
21	Secure Console
22	Reserved
23	Reserved

E

Updating System Firmware

Introduction

This appendix explains how to use the firmware update utility. It is the user's responsibility to update the system firmware.

System Firmware

The AlphaStation 500 Series system contains four flashROMs, two with ARC console firmware (for the Windows NT operating system) and two with SRM console firmware (for the Digital UNIX and OpenVMS operating systems). Refer to the Alpha Systems Firmware Update documentation that is contained on the Firmware Update CD for compatible firmware and operating system versions.

Update Utility

Use the update utility to update your ARC and SRM firmware. See the section on Using the Flash Update Utility later in this appendix for additional information. The update utility contains three images: the update utility itself, the SRM image, and the ARC image.

Flash Enable Jumper

Before you can update your system firmware, the flashROM enable jumper (J18) must be in the write-enabled position. Refer to the section on System Board Jumpers in Appendix C and to Figure C-1 for additional information.

Using the Flash Update Utility

To update the firmware:

1. Insert the CD-ROM with the updated firmware.
2. Reboot the system.

You should see a display similar to the following while the update utility is loading and executing:

```
>>>b -fi M2_0_upd.mop ewa0
(boot ewa0.0.0.6.0 -file M2_0_upd.mop -flags 0)

Trying MOP boot.....................

Network load complete.
Host name: ALCOR3
Host address: aa-00-04-00-36-77

bootstrap code read in
base = 136000, image_start = 0, image_bytes = 11ce00
initializing HWRPB at 2000
initializing page table at 128000
initializing machine state
setting affinity to the primary CPU
jumping to bootstrap code
ff.fe.fd.fc.fb.fa.f9.f8.f7.f6.f5.
ef.ee.ed.ec.eb.ea.e9.f4.e8.e7.e5.e4.
 Digital AlphaStation 500 5/266 Console V1.0-1
        built on Nov 8 1995 at 16:45:12
Maverick startup
>>>Execute Update Sequence
Update Script Complete
(boot pmem:180000 -flags 0)
bootstrap code read in
base = 180000, image_start = 0, image_bytes = 800000
initializing HWRPB at 2000
initializing page table at 728000
initializing machine state
setting affinity to the primary CPU
```

```
jumping to bootstrap code
*** Firmware Update  ***
*** System Type: Maverick ***
Update
Verify
List
Show
Dump
?
Apu->
```

3. To update the firmware, type **update**. The following information will be displayed as the firmware updates. The actual information may change between versions.

```
Apu-> update
image_hdr = 15740
try to find ROM images
image_desc = 15748
Header Image at 0x15c00
Version = 4.43
Vendor     = DEC
Product    = MAVERICK
Firmware   = MAVERICK_ARC
Length     = 0x3bc1d
 strncmp 0
Rom Set    = 1 (Roms 2,3)
APU-I VERIFY LOADED ROM IMAGE
0x3bc5d
Loaded Image Exp Check 0xa Calc Check 0xa
APU-I VERIFY LOADED ROM IMAGE DONE
Rom 2 Manufacturer = Intel (0x89)  28F020  (0xbd) 256K x 8
Rom 3 Manufacturer = Intel (0x89)  28F020  (0xbd) 256K x 8
image_hdr = 15740
```

```
try to find ROM images
image_desc = 15748
image_desc = 15758
Header Image at 0x51a00
Version    = v1_0-1
Vendor     = DEC
Product    = MAVERICK
Firmware   = MAVERICK_SRM
Length     = 0x6e200
 strncmp 0
Rom Set    = 0 (Roms 0,1)
APU-I VERIFY LOADED ROM IMAGE
0x6e240
Loaded Image Exp Check 0x7d Calc Check 0x7d
APU-I VERIFY LOADED ROM IMAGE DONE
Rom 0 Manufacturer = Intel (0x89)  28F020  (0xbd) 256K x 8
Rom 1 Manufacturer = Intel (0x89)  28F020  (0xbd) 256K x 8
image_hdr = 15740
try to find ROM images
image_desc = 15748
image_desc = 15758
Header Image at 0x51a00
Version    = v1_0-1
Vendor     = DEC
Product    = MAVERICK
Firmware   = MAVERICK_SRM
Length     = 0x6e200
 strncmp 0
Rom Set    = 0 (Roms 0,1)
APU-I VERIFY LOADED ROM IMAGE
0x6e240
Loaded Image Exp Check 0x7d Calc Check 0x7d
```

```
APU-I VERIFY LOADED ROM IMAGE DONE
APU-I *** ROMS 0,1 CONTENTS WILL BE DESTROYED ***
APU-I ARE YOU READY TO PROGRAM DEVICE ? (Y/N ) y
Rom 0 Manufacturer = Intel (0x89)  28F020  (0xbd) 256K x 8
Rom 1 Manufacturer = Intel (0x89)  28F020  (0xbd) 256K x 8
APU-I ROM SET NOT ERASED
APU-I PRECHARGING DEVICE
0x80000
APU-I ERASING ROM DEVICE
0x80000
APU-I PROGRAMMING DEVICE
0x6e240
APU-I ROM 0 VERIFYING ROM IMAGE
0x6e240
APU-I PROGRAMMING COMPLETED
0x6e240
0x6e240
SRM Rom Update Successful
image_hdr = 15740
try to find ROM images
image_desc = 15748
Header Image at 0x15c00
Version    = 4.43
Vendor     = DEC
Product    = MAVERICK
Firmware   = MAVERICK_ARC
Length     = 0x3bc1d
 strncmp 0
Rom Set    = 1 (Roms 2,3)
APU-I VERIFY LOADED ROM IMAGE
0x3bc5d
Loaded Image Exp Check 0x1a Calc Check 0x1a
```

```
APU-I VERIFY LOADED ROM IMAGE DONE
Rom 2 Manufacturer = Intel (0x89)  28F020  (0xbd) 256K x 8
Rom 3 Manufacturer = Intel (0x89)  28F020  (0xbd) 256K x 8
APU-I ROM SET NOT ERASED
APU-I PRECHARGING DEVICE
0x80000
APU-I ERASING ROM DEVICE
0x80000
APU-I PROGRAMMING DEVICE
0x3bc5d
APU-I ROM 1 VERIFYING ROM IMAGE
0x3bc5d
APU-I PROGRAMMING COMPLETED
0x3bc5d
0x3bc5d
ARC Rom Update Successfull
Apu->
```

4. Use the **verify** SRM command to verify the integrity of the SRM firmware.

```
Apu-> verify
ARC Rom Verify Successful
SRM Rom Verify Successful
```

5. To exit the update utility, type **quit**.

```
Apu->quit
```

F

Starting an Operating System Installation

Introduction

This appendix provides the information you need to begin an operating system installation. After you have started an installation, you can complete it by following on-screen instructions and referring to the appropriate operating system documentation.

Using the table below, first locate the operating system you want to install and refer to the appropriate table number.

If you want to install:	Go to Table:
Install Window NT Workstation on a properly partitioned and formatted disk.	Table F-1
Set up partitions for a Windows NT Workstation installation	Table F-2
Digital UNIX	Table F-3
OpenVMS	Table F-4

CAUTION

If you boot from a Digital UNIX or Open VMS disk and also occasionally boot Microsoft Windows NT Workstation from another disk, use caution when you run the Windows NT Disk Administrator. When the Disk Administrator detects additional disks, it updates the system configuration. The Disk Administrator prompts you for permission to write a signature to the additional disks. Writing the signature to a Digital UNIX or Open VMS disk *destroys* the boot block on that disk and makes the operating system on that disk no longer bootable. Select **NO** when you are asked if you want to write a signature to your Digital UNIX or Open VMS disks.

Starting a Windows NT Workstation Installation

Digital partitions and formats disk 0 on the first SCSI controller in non-RAID Windows NT Workstation systems. The partitions are set up as follows:

- Partition 1 (typically, the “C” drive) is the size of the disk less 10 MB and formatted FAT. Normally, you select “convert to NTFS” during the Windows NT installation.
- Partition 2 (typically the “D” drive) is 10 MB, formatted FAT, and identified as the system partition.

Refer to Table F-1 for the steps to start installing Windows NT Workstation on a properly partitioned and formatted disk.

NOTE

The ARC console must be installed and running in order to perform a Windows NT installation. If the SRM console is running, refer to Appendix E, Updating System Firmware, for the instructions to load the ARC firmware.

Table F-1 Starting a Windows NT Workstation Installation

Step	Action	Result
1	Insert the Microsoft Windows NT Workstation CD-ROM into the CD drive.	CD-ROM drive is ready.
2	From the ARC console boot menu, select **`Supplementary menu...`**	Supplementary menu displays.
3	Select **`Install Windows NT from CD-ROM.`**	Windows NT setup procedure starts. Follow the on-screen instructions. For more information, refer to the *Microsoft Windows NT Workstation System Guide*.

Starting an Operating System Installation

If you are installing the operating system on a disk that has not been partitioned and formatted, follow the procedure in Table F-2.

Table F-2 Setting Up Partitions for a Windows NT Workstation Installation

Step	Action	Result
1	Insert the Microsoft Windows NT Workstation CD-ROM into the CD drive.	CD-ROM drive is ready.
2	From the ARC console, select **`Run a Program`**	You are prompted for the program name. ARCINST, the ARC installation program, provides a means to partition and format the disk for NT prior to installing Windows NT.
3	At the prompt, type **`cd:\alpha\arcinst`**	If you encounter a "Pathname is not defined" error, go to the ARC console Setup menu an select **`Set the environment variables.`** Select CD-ROM, then enter the SCSI bus number and ID of the CD-ROM drive. Next, select **`Set the default configuration`** and follow the steps. Save the changes and repeat step 4.
4	Choose **`Configure Partitions`**	Partition menu displays choices that allow you to create, delete, or make an existing partition into a system partition.
5	Choose **`Create Partition`**	A list of available target devices displays. `SCSI bus 0, Identifier 0, Disk 0 (scsii(0)disk(0)rdisk(0))` Identifier is the ID of the SCSI device, drive 0 in this case.

Starting a Digital UNIX Installation

To start a Digital UNIX installation, refer to Table F-3.

Table F-3 Starting a Digital UNIX Installation

Action	Result
1. If the SRM console is running, go to Step 4. If the ARC console is running, from the Boot menu, select the **`Supplementary menu...;`** then select **`Set up the system....`** From the Setup menu, select **`Switch to OpenVMS or Digital UNIX console`**. Select **`Switch to Digital UNIX`**.	Selecting **`Switch to Digital UNIX`** will cause the system to run the SRM console after the next power cycle or reset button.
2. Cycle the system's power.	Cycling power after selecting the Digital UNIX or OpenVMS console results in the system restarting with the SRM console running.
3. At the SRM prompt (**>>>**), type: **`set boot_osflags`**	Clears the *boot_osflags* variable.
4. At the SRM prompt (**>>>**), type: **`set auto_action halt`**	Halts the system at the console prompt each time the system is turned on, crashes, or when the reset button is pushed.
5. Insert the *Digital UNIX for AXP™ Systems* CD-ROM into the CD drive.	The CD-ROM drawer closes.
6. At the SRM prompt (**>>>**), type: **`show dev`**	List of devices displays: **`dka0.0.0.6.0 DKA0 RZ26L 441A`** **`dka500.4.0.6.0 DKA500 RRD43 3213`** **`dva0.0.0.0.1 DVA0`**
7. From the SRM console, boot the Digital UNIX CD-ROM. At the SRM prompt (**>>>**), type: **`boot dka500`**	Installation information is displayed and you are prompted to select an option. For more information, refer to the *Digital UNIX Installation Guide.*

Starting an OpenVMS Installation

To start an OpenVMS installation, follow the steps in Table F-4.

Table F-4 Starting an Open VMS Installation

Action	Result
1. If the SRM console is running, go to Step 4. If the ARC console is running from the Boot menu, select the **Supplementary menu...**; then select **Set up the system....** From the Setup menu, select **Switch to OpenVMS or Digital UNIX console.** Select **Switch to OpenVMS**.	Selecting **Switch to OpenVMS** causes the system to run the SRM console after the next power-cycle.
2. Cycle the system's power.	Cycling power after selecting the Digital UNIX or OpenVMS console results in the system restarting with the SRM console running.
3. Insert the OpenVMS CD-ROM into the CD drive.	CD-ROM drawer closes.
4. At the SRM prompt (**>>>**), type: **show dev**	List of devices displays: **dka0.0.0.6.0 DKA0 RZ26L 441A** **dka500.4.0.6.0 DKA500 RRD43 3213** **dva0.0.0.0.1 DVA0**
5. From the SRM console, boot the OpenVMS CD-ROM. At the SRM prompt (**>>>**), type: **boot -flags 0,0 dka500**	Installation information is displayed and you are prompted to select an option. For more information, refer to the *OpenVMS Installation Guide.*

G
Sound Card Overview

Introduction

This appendix describes the Digital AlphaStation 500 Series system sound card. The card is installed in a dedicated slot in the motherboard.

Module Layout

Figure G-1 and Table G-1 describe the connectors and jumpers for the Digital AlphaStation 500 Series system sound card.

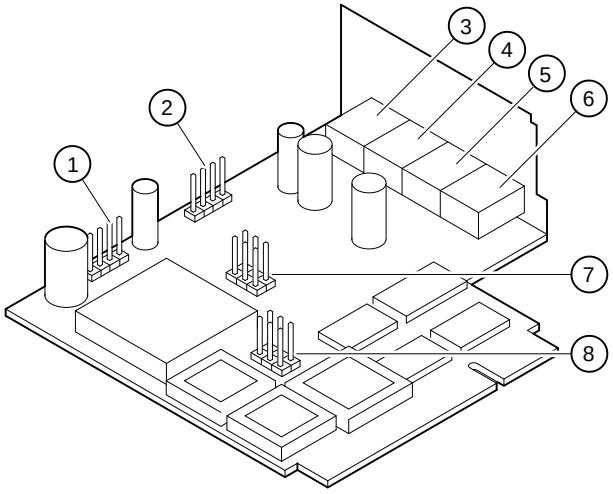


Figure G-1 Card Connectors and Jumpers

Table G-1 Card Connector and Jumpers

Figure Legend	Component	Function
1	J5	Speaker output
2	J6	CD Audio
3	J7	Headphone jack
4	J4	LINE OUT jack
5	J2	Microphone jack
6	J3	LINE IN
7	J8	Not used
8	J9	Sound card configuration jumpers

Module Connectors

There are three connectors on the module (J8 is not used). Since none is keyed, look for a pin 1 designation on both the cable connector and the module connector.

The speaker connector (J5 SPKR) works correctly, even if the connector is put on upside down. Speaker connector pinouts are listed in Table G-2 below:

Table G-2 Speaker Connector Pinouts

Pin	Signal
1	4-32 Ohm speaker
2	Unconnected
3	Unconnected
4	Ground

Use the CD connector to route CD audio from a CD-ROM drive to the audio card. The CD connector (J6 CD) left and right channels are reversed if you put the connector on upside down. Pinouts for the CD connector are listed in Table G-3:

Table G-3 CD Connector Pinouts

Pin	Signal
1	Left channel
2	Ground
3	Ground
4	Right channel

Module Jumpers

The sound card uses jumpers located at J9 to select the motherboard sound routing and to set the card's bus address.

The TCE (timer-counter enable) jumper determines whether or not sounds generated on the motherboard go to the speaker. The TCE jumper is factory-set to allow beeps to go to the speaker (jumper in), as listed in Table G-4 below:

Table G-4 TCE Jumper

Pin	Signal
TCE IN J9 (1-4)	Motherboard beeps to speaker (D).
TCE OUT	Motherboard beeps are ignored.

(D) = Factory default

The SW1 and SW2 jumpers determine the base address of the audio module. These are factory-set (both jumpers in) and should only be changed when the address conflicts with another option's address. See Table G-5.

Table G-5 SW1 and SW2 Jumpers Audio Module Base Address

SW1 J9(2-5)	SW2 J9(3-6)	Base Address
OUT	OUT	x604
OUT	IN	xF40
IN	OUT	xE80
IN	IN	x530

External Connection Jacks

The rear-panel jacks are standard 3.5-mm stereo jacks.

Plugging a headphone into the headphone jack disables the speaker. You can plug a pair of speakers into the headphone jack. (Amplified speakers are recommended.)

The microphone jack is for an electret microphone (2.2 Kohm to 2.5V).

You may use line-in and line-out jacks to connect receivers, amplifiers, or other audio equipment.

Software

Before applications can use your sound card, the card must be known to your operating system. Each operating system has a unique way of learning about the card. The following section explain how to get this process underway for each operating system.

Microsoft Windows NT Workstation Operating System

To make the sound card available to Windows NT application, you must install and set up the driver, as the following steps describe:

1. From the Control Panel, select **Drivers**.
2. Click Add, and choose **Windows Sound System** from the list of drivers. Then click **OK**. (If the driver is not present on the system disk, you may be prompted to load Windows NT distribution media.)
3. The Windows Sound System Driver menu appears. Select **Interrupt 7(IRQ7),** the default DMA channel, and the default I/O address.

Digital UNIX Operating System

The Digital UNIX operating system supports the sound card through Multimedia Services for Digital UNIX, which is normally preloaded at the manufacturing site. The manufacturing site also loads the sound card configuration information into the SRM console configuration database. The information in the database is passed onto the operating system.

Use the following command to verify that the sound card is loaded into the configuration database:

>>>isacfg -all
You will know the sound card is loaded if you see a record with the handle “PCXBJ.”

☞ Refer to the ISACFG section of Appendix A for more information.

Use the following command when you are logged in as “root” to verify that the multimedia services are installed:

#setld -I |grep MME
installed

Look for the following response and verify that the word **installed** is present:

MMExxxxxx installed xxx xxx Audio Card Driver

☞ Refer to the *Multimedia Services for Digital UNIX AXP Installation Guide* for more information.

Digital’s multimedia application programming interface (API), which is included with the Multimedia Services for Digital UNIX, is based on Microsoft’s Video for Windows interface. This provides developers with a common API and supports for the same audio and video file formats as Video for Windows does.

OpenVMS Operating System

The OpenVMS operating system contains a sound driver that supports the sound card. Configuration information is stored in the SRM console configuration database.

Usually, the manufacturing site loads the sound configuration information into the SRM console configuration database. The information in the database is passed onto the operating system.

Use the following command to verify that the sound card is loaded into the configuration database:

>>>isacfg -all
You will know the sound card is loaded if you see a record with the handle “PCXBJ.”

☞ Refer to the ISACFG section of Appendix A for more information.

H
Equipment Log

Introduction

With the equipment log, you can gather information that you may need if problems occur with your system and you need to call Digital for assistance.

Use the equipment log to record information about your system hardware and software components. Update the equipment log when you add options.

Equipment Log

The log consists of five tables, which you can use to record the following information:

- Your system's hardware components (Table H-1
- Your SCSI device address settings (Table H-2)
- Your system's system hardware configuration (Table H-3)
- The operating system or application software installed on your AlphaStation 500 Series system (Table H-4)
- Additional components (Table H-5)

Equipment Log

Table H-1 Hardware Components

Component	Vendor/ Type/Size	Model Number	Serial Number	Date Installed
System unit	AlphaStation	500 Series		
System unit key number				
Monitor				
Keyboard				
Mouse				
Installed diskette drive				
Additional storage device 1				
Additional storage device 2				
Additional storage device 3				
Additional storage device 4				
Additional storage device 5				

NOTE

See the regulatory label on the rear bulkhead for such information as the serial number.

Table H-2 SCSI Addresses

Device	Address	Device	Address

Table H-3 Hardware Configuration

Component	AlphaStation 500 Series System Specifics
CPU speed and model	
Firmware version	
Memory size	
Video module	

Table H-4 Installed Software

Operating System or Application Software	Version Number	License Number	Date Installed

Table H-5 Additional Component Information

Component	Vendor	Model Number	Serial Number	Date Installed

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